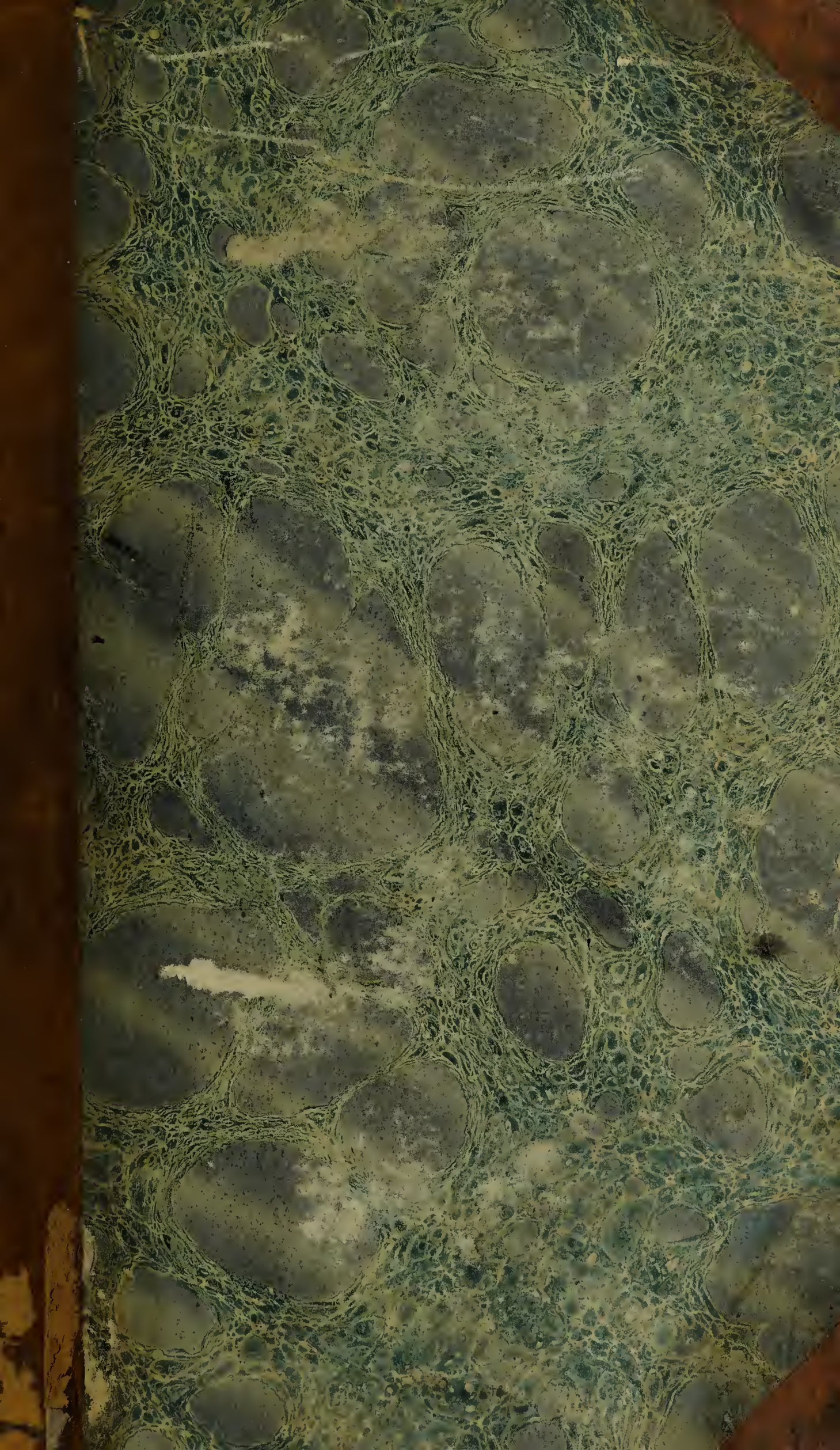

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ON

THE CLIMATE OF BANGALORE,

AND

THE PREVALENCE OF HEPATITIS

AT THAT STATION.

By J. MOUAT, M. D.

Presented 5th Nov. 1831.

Previous to the comparatively very recent discovery of the Neilgherries, Bangalore was deemed the Montpellier of Madras. As it still maintains its character for salubrity and the delightful coolness of its climate, and continues the frequent resort of invalids; the following observations, taken from my Annual Report for the past year, may not be uninteresting to my friends in the Medical and Physical Society of Calcutta.

Meteorological Observations for 1830.

January.—The weather for the greater part of the month has been tolerably cool, with several foggy mornings. Thermometer ranging from 62° to 71°, and the wind north-east.

February.—Close and sultry, nearly the whole month. Wind variable. Thermometer from 65° to 80°.

March.—Very close and sultry, the whole month; the wind north-east, and the Thermometer from 71° to 84°. No rain fell during the quarter, and latterly the heat became exceedingly oppressive.

April.—At times oppressive, though on the whole agreeable to the feelings, and the nights pleasant. The extreme range of the Thermometer from 73° to 87 degrees, but varying in general from 75° and 76° to 80° and 84°, with cloudy weather and frequent showers, and some heavy falls of rain, accompanied by thunder and lightning.

May.—At the commencement was hot, but the numerous showers which fell rendered the close of the month cool and delightfully agreeable; so much does the climate of this place appear to be influenced by the fall of rain. It rained 1st, 2nd, 12th, 13th, 14th, 15th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, and 28th. Up to the 15th, wind either easterly or variable, and subsequently westerly breezes and cool cloudy weather. The Thermometer has been at 70°, and rose one day (the 12th, just before the rain) to 87°; but towards the latter part of the month it ranged from 71° to 79½°.

June.—Has also been delightfully cool and temperate; the weather cloudy, with constant showers; some heavy falls of rain. It rained 1st, 2nd, 3rd, 4th, 6th, 8th, 9th, 10th, 11th, 12th, 14th, 15th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, and 25th. The wind nearly due west, or varying to south-west, and generally blowing a strong breeze.

July.—The sun obscured nearly the whole month, so that its bad effects were scarcely felt. Only five fair, and twenty-six rainy days. Thermometer 69° to 79°; its greatest variation though in general but four or five degrees in the 24 hours; the air damp, and at times very chilly. Wind westerly and south-west.

August.—Very similar to the foregoing month; the extreme ranges of the Thermometer being 68½° to 77°, and the general variation three, four, to five degrees in the 24 hours. The weather cool and agreeable, with but seven fair days. The wind nearly due west, and occasionally south-west.

September—(At times), as the weather cleared up, hot and oppressive, and the sun powerful, yet on the whole cool, with sixteen rainy days. Wind westerly and variable. The Thermometer ranging from 68° to 77½°, and the daily variation from five to six degrees. Scarcely any Barometric variation.

It was observed in the Quarterly Report, ending September, "Indeed so agreeable and pleasant a climate, so near the equator, "can scarcely be found for such months as July, August, and "September; so agreeable to the feelings, so refreshing to the "frame, with little of that relaxation or oppression usually experi-"enced in other places in India; and certainly with evident bene-"fit to the sick, reducing the number, and mitigating the severity "and violence of the attacks."

October.—Was very pleasant; it rained 18 days, yet the Thermometer's greatest range was from 70° to 79°, though from 74° to 77° was the general diurnal variation. The Barometer was nearly stationary. It descended .05 on the 28th, when much rain fell. The wind generally south-west, at times north-east and north-west.

November.—Also very agreeable; the mornings and evenings cold, and fair nearly the whole month; some showers fell on the 14th, 19th, 20th, 21st, and 23rd. Thermometer generally from 70° to 75°, with 68° to 79° for the extreme variations. Occasional fogs in the morning; the sky clear; the wind northerly and north-east, and the nights very cold. The sick list rapidly diminishing.

December.—Very cold; the air elastic and bracing; the sky cloudless; the wind strong from the north and north-east, and the mornings frequently foggy. Thermometer 65° to 75½°, though generally from 68° to 72°. Very few sick, and the cases of the most mild and tractable description.

The temperature, as detailed in the foregoing observations, has for the last nine months been taken by the Register Thermometer, kept in a cool sitting room, and therefore likely to indicate pretty accu-

rately the diurnal variations within doors. It would certainly have risen considerably, if exposed to the sun, and fallen some degrees, if left out in the chilly damp air at night.

Bangalore, at present occupied by the 13th Dragoons, is in Latitude 12° 57′ and Longitude 77° 46′ East. It is the Head Quarters of a Division of the Madras Army, and is situated in the province of Mysore. The latter appellation is supposed by Colonel Franklin to be derived from Mahespúra, "the terrible," an attribute of Siva, or Mahadeo, of the Hindoo Mythology. It extends from the 11th to the 15th degrees of north latitude, is encircled by the British possessions, and is said to average 140 miles in breadth, and 210 in length. It is enclosed by the eastern and western ghauts, and is a table land, nearly three thousand feet above the level of the sea. The highest part of this plateau includes the station of Bangalore, together with Nundydroog, Colar, and Oosoor, forming an area of about sixty miles by fifty, and it presents a mean altitude of three thousand feet. There is a rapid fall thence on every side. The climate of this elevated region is comparatively cool, the general aspect of the country hilly and barren, or covered with jungle, yet many parts are highly fertile, when properly cultivated.

Numerous rivers, as the Cauvery, Toomboodra, Panoor, Vedowatti, &c. &c. arise in Mysore, which

like most hill torrents, during the rains, are rapid and formidable, though at other periods mostly insignificant streams. The waterfalls of the Cauvery, at certain seasons, are said to compete in effect, and grandeur with the celebrated falls of Niagara.

Little is known regarding the mineral productions of Mysore. Iron ore abounds in various districts, and also the muriate of Soda, in several places; both formed or rather did form in the days of Tippoo important articles in the domestic economy of the natives. Their manipulations in the former are extremely rude, and in the latter imperfect. The appearance of the country is strongly volcanic, and the vertical nature of some of the strata would lead to the same conclusion. At any rate, earthquakes or slight shocks have been experienced, and nearly all the wells about two years ago suddenly became dry, which was imputed to this cause.

The rocks are stratified, often in a most confused manner, though in general it is very regular, either horizontal, vertical, or in all degrees of inclination; many of these present the most fantastic and curious forms, the more durable remaining poised in the air, or elevated on the crest, or summit of other rocks, arising from the softer particles, having disappeared in the course of ages. The whole of these rocks are granite or gneiss; composed in general of felspar and quartz, with a small proportion of green mica. Strata

of gneiss, hornblende, and primitive greenstone, are found in many parts. Some of the rocks rapidly decompose, when exposed to the action of the atmosphere, and crumbling down, form a bed of coarse sand. Here the felspar is supposed to have been decomposed, and in a state of powder, while the quartz retains its natural and angular appearance. Other granites appear to be most durable, and admirably adapted for building. Blocks of any size can be obtained in the greatest abundance, and at the most trifling expense. The native mode of quarrying is simple, and indeed scientific. The rock is first chiseled to the depth of the slab that may be wanted; a fire is then made on it, the extent and intensity according to the size and the thickness of the mass required, and water is poured on it when thus heated. It suddenly cools and contracts, and like glass, fractures; masses of any size are thus easily detached. Calcareous nodules, called *kunkar* in Bengal, are also found in some places, and by burning form excellent lime. These are apparently a kind of tufa or traventine deposited by the water. This would indicate that the water contained carbonic acid, which has passed over calcareous strata, and held a portion in solution, which had been deposited in the form of these nodules.

The soil, except in the valleys and wooded districts, is poor; yet, even the worst places with irrigation, or during the rains, aided by a little manure, pro-

duce good crops. The decayed vegetable matters, which, in many part of India, prove so rich an alluvial soil, do not to any extent exist here, and therefore the necessity by manure of improving the productive quality of the land. It is, however, one of the few places in this country where manuring is so constantly practised. Even the most apparently sterile, elevated, sandy, or gravelly parts, with a sufficient supply of water, and manual labour and industry, will raise the general variety of native grains.

There is a curious and valuable property of the earth or mud in many places, of becoming consolidated almost into a perfect rock. It is a red and ferruginous clay, mixed with fragments of quartz and decayed particles of granite, which when moistened and pressed together forms excellent walls and capital roads of the most durable nature. Indeed, the very face of the country in many places presents an appearance almost of stony hardness. This consists of clay, sand, and small fragments of granite, which when undisturbed soon concrete into a very hard mass, impenetrable to all kinds of vegetation; yet when reduced and broken up, producing tolerable crops.

Water is obtained either from wells or tanks: the former probably are too expensive for the Natives to use for general cultivation, as is done in the Upper Provinces of Hindostan; and the latter require pecu-

liar localities, being generally large sheets of water dammed in by embankments, which run from one elevation to another, and the ravine or intermediate valley is thus formed into a tank. But it must be apparent, it is only the fields which lie lower than this water, which can be irrigated by it; so that except from the rain, and during the monsoons, the poverty of the people, or the want of capital, must leave the greater portion of the high lands uncultivated.

That a great portion of the immediate neighbourhood, and indeed extensive tracts in all directions are barren or waste, and thinly populated, is too true, and the contemplation both melancholy and humiliating: since Bangalore itself is merely the crest of a barren rocky elevation, once poor and sterile, but now arising from industry, aided by its own delightful climate, abounding with almost every natural production; shewing what the whole country might be under more favourable auspices. History gives but a repetition of predatory inroads, superadded to domestic pillages; and though Hyder was a prince, whose genius and foresight did much to ameliorate the condition of his subjects, yet his sceptre passed into the hands of his son Tippoo, whose restrictions on commerce and oppressions, and the miseries of war, are said to have nearly depopulated many, and to have impoverished all parts of his territories.

The great mass of the inhabitants are Hindoos, with a small proportion of the followers of Mahomet. They appear an active, cheerful, and well-formed people, with every variety of cast and feature. Their domestic habits exhibit little that is peculiar, and many seem to reach to an advanced period of life. Their habitations resemble the rude, and to our ideas, comfortless dwellings of the natives of Hindostan; the same mud huts, with the temples of their gods, and the palaces of their rulers.

The houses or residences of the officers at this station are in general inferior in size and accommodation to the bungalows in Bengal. They are all tiled, and from having windows of a smaller size than the doors, have a good deal the appearance of cottages in England. This gives them a confined appearance, yet they seem well adapted to the fine equable climate of Bangalore, too warm for a fire, yet too cool for the large windows, free exposure, and great drafts, so much required at certain periods in less favoured parts of India.

Vegetation is extremely rapid, and wonderfully exuberant, and certain parts of the country yield to few places in romantic scenery and the delightful wilds of nature. The climate is most congenial to vegetable life. The cypress and vine grow luxuriantly, and the apple and peach produce excel-

lent fruit. There is scarcely any sensible fall of the leaf; the old ones remain till displaced by the young buds, and these rapidly expand into foliage, so that most plants are ever clothed in their gayest garb of green. The whole of the seasons appear converted into delightful spring, and the gardens decorated with an endless variety of flowers of the most brilliant hues. From the English oak to the Malabar teak, there is scarcely a limit to vegetation; or the associations so intimately connected with such a fanciful and bountiful display of nature's choicest and rarest productions.

The air is always elastic, and generally pleasant, even in the hot season; and during the monsoons moist, but not relaxing or disagreeable, though at times cool and chilly. Too much can scarcely be said in praise of the climate of Bangalore: it is truly excellent, and convalescence most rapid even from acute disease; neither does it seem to predispose to phthisis*, hooping-cough, or croup, nor to retard the recovery of those affected with syphilis, or occasion intermittents. In the jungles, and at Seringapatam, remittent fevers are prevalent, but these arise from local causes. The coolness may not prove favourable to asthmatic subjects, or delicate persons who are easily affect-

* In nearly 13 years, only two men have died of consumption in he regiment.

ed by changes of temperature and so rarefied an atmosphere; or those who are labouring under organic deranged structure, and certain idiosyncrasies of constitution: but to all others, it must be a delightful and happy change from the heat of the Carnatic, or the relaxing effects of Malabar, and of most other Indian stations.

Hepatitis is certainly very prevalent, but this disease can fairly be attributed to exposure to the sun and intemperance. The general mildness and great equability of the temperature, cannot fail to be observed, and therefore lead to the conclusion, that Bangalore must be favorable to the human frame; for the causes of sickness at this station can be traced to other sources than those of mere climate. Mysore owes its delightful temperature, principally to its great elevation; hence its pure elastic atmosphere, cooled as it is by the copious, though gentle showers of two monsoons, which seem to cheer, to animate, and invigorate all nature.

We have already stated, the country in the immediate neighbourhood of Bangalore is both barren and hilly; or rather an endless succession of elevations, separated by valleys of greater or less extent, and the latter in general fertile and well cultivated. Still from there being very few trees, the vegetation stunted, and at certain periods quite barren, with a

look peculiarly bleak and unpromising; the sudden transition, and great contrast, exhibited by the cantonments, present to the imagination the picture of a little Eden in the midst of a waste. The varied and luxuriant vegetation of a tropical country give it a most charming appearance. It is, as has been noted, everlasting spring, if such an expression may be used; and it enjoys, from its elevation of two thousand nine hundred feet above the level of the sea, an air peculiarly balmy and delightful, literally at times a zephyr*, and "its freshness a breath stolen by the spring from the summer." What adds to the wonder is, to see many of the fruits and vegetables of Europe thriving near the guava, the pine-apple, the shaddock, the mango, Avocado pear, &c. &c. of the tropics. The vegetables are excellent; rarely surpassed, and seldom equalled even in the northern parts of India. If European arts, civilization, and colonization are ever destined to take root in India, this might be, amongst many others, an eligible spot for their commencement.

The cantonments are laid out with considerable regularity, along the crest of an extensive elevation,

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* Sir H. Davy's Consolations of Travel.

running nearly east and west for a couple of miles. On the east are a Brigade of Horse, with some Foot Artillery ; next to them the 13th Dragoons ; to these again H. M. 62nd Foot ; and to the rear or north of these two corps, the 7th Native Cavalry ; and on the west of H. M. 62nd are four Native Infantry Regiments. In front is a beautiful parade, nearly surrounded by officers' bungalows, running parallel in lines, and also on the east end, as far as the Artillery barracks. In every thing connected with the military cantonments, few stations in India can boast of greater advantages, or more convenience ; and the nature of the localities in the vicinity does not appear to be such as can produce any unfavorable influence on the health of the Troops. Looking nearly due west, at the distance of a couple of miles, we see the city of Bangalore, not without its local associations, as once the possession of the celebrated Hyder Ally ; and the palace of Tippoo still serves to raise many curious recollections, interesting to the historian, but unconnected with the medical topography of this place.

Diseases.

In looking over the returns of the regiment, since its arrival in India, though it does not appear that there has been an unusual prevalence of any particular disease, during the past year, as to frequency or mortality ; nevertheless, there has been much sickness, both as to numbers and severity, during certain

months; which may be detailed, previous to noticing the most prevalent individual affections.

In December, (1829,) the Regiment was particularly healthy, but the irregularities of Christmas and the New Year, sent numbers into the Hospital; and again, since the setting in of the hot-season, the heat was great, as no rain had fallen during the quarter. The sickness continued progressively increasing as to violence and number, until March; so much so, indeed, that the following observations, presented to the Deputy Inspector General of His Majesty's Forces, who was then at the station, with His Excellency Sir George Walker, and also to the officer commanding the regiment, will best illustrate the subject.

Observations for April.

During the past month (April), the weather, though oppressive at times, has yet, on the whole, been agreeable to the feelings, the nights pleasant, the extreme ranges of the thermometer from 73° to 87°, but varying in general from 75° and 76° to 80° and 84°, with cloudy weather, frequent showers, and some heavy falls of rain, accompanied by thunder and lightning.

With a temperature so moderate and agreeable, with such slight thermometric variations, and so mild a climate, how comes it, that we have had so much acute disease in hospital, of so active a nature and such high inflammatory characters? Perhaps this

will be best illustrated by the following table of acute cases during the month.

Table of Acute Cases.

Number.	Names.	Date of Admission.	Diseases.	How many times bled.	Number of Ounces drawn.	How many leeches applied.	Quantity of Calomel taken.	Remarks.
1	John Cortiett,....	1st April.	Dysenteria Acuta,	1	24	„	114	
	William Mitchell,	3rd do.	Catarrhus Acutus,	1	24	„	16	
	Michael Mahar,..	4th do.	Febris Cont. Com.	1	20	12	32	
	James Reynolds,.	4th do.	do.....	1	25	12	27	
5	Thomas Herbert,.	4th do.	do.....	2	50	„	25	
	Robt. Devonshire,	5th do.	do.....	2	36	„	61	
	John Kelly, ...	5th do.	Pneumonia, ...	1	24	18	4	Died 8th April.
	Edward Davis, ..	8th do.	Apoplexia, ...	1	32	24	185	
	Jonathan West,..	9th do.	Rheumatismus Ac.	1	30	„	49	
10	William Condon,	9th do.	Diarrhœa, ...	„	„	24	421	
	Christ. Devoy, ..	10th do.	Dysenteria Acuta,	2	36	16	70	
	Thomas Black, ..	10th do.	do.....	1	20	„	26	
	Patrick Conlan,..	10th do.	Rheumatismus Ac.	3	52	„	210	
	Samuel Moore, ..	10th do.	Hepatitis Ac.....	1	16	24	87	
15	Robt. Whisken,..	11th do.	Dysenteria Acuta,	1	20	„	30	
	George Smith, ...	13th do.	Febris Cont. Com.	1	24	31	41	
	William Godhier,	14th do.	do	2	54	24	111	
	James Pemberton,	14th do.	do	1	25	72	76	
	John Moore, ...	15th do.	do	2	46	40	90	
20	Peter Cassady, ..	15th do.	Hepatitis Acuta,.	3	64	90	112	
	Thom. Marshman,	16th do.	Febris Cont. Com.	2	54	48	50	
	William Elliott,..	16th do.	Pneumonia,.. ...	2	48	12	60	
	Richard Brennon,	17th do.	Dyspepsia, ...	„	„	„	26	
	Samuel Plant,....	17th do.	Hepatitis Acuta,..	3	72	60	40	
25	James Carroll,...	17th do.	do.....	3	60	20	60	
	James Garvey, ..	18th do.	Febris Cont. Com.	1	20	„	69	
	James Maclin,...	18th do.	do.....	3	60	„	30	
	Joseph Balls,....	20th do.	do.....	„	„	„	25	
	John Davis,.....	21st do.	Epilepsia, ...	1	26	18	30	
30	William Graham,	22nd do.	Hepatitis Acuta,.	4	72	15	162	
	James Smith,....	22nd do.	Dysenteria Acuta,	2	46	24	110	
	Henry Tottman,..	23rd do.	Febris Cont. Com.	1	24	12	18	
	Patrick Brophy,..	23rd do.	do.....	1	30	„	12	
	Robert Oldham,..	25th do.	Splenitis,.....	1	24	74	20	
35	George Roberts,..	27th do.	Hepatitis Acuta..	5	100	„	60	
	Ewd. McDermott,	27th do.	do.....	3	62	48	130	
	James Rose,.....	27th do.	do.....	2	46	36	126	
	Charles O'Neil,..	28th do.	do.....	2	48	76	43	
	Walter Reily,...	28th do.	Febris Cont. Com.	2	38	24	80	
	William Brown,..	28th do.	Dysenteria Acuta.	2	40	„	74	
	James Cook,.....	28th do.	Rheumatismus Ac.	1	24	„	„	
42	Samuel Connell,..	28th do.	Ophthalmia,.....	„	„	8	3	

A statement of disease so violent, and of practice so active, naturally leads to some inquiry as to its

source, particularly as it varies, in some degree, from that of the Royal Regiment, stationed in the same place, occupying similar barracks, and clothed and fed alike. Mr. Shean, in charge of that corps, considers the cases less violent and urgent in the Royals, and consequently requiring a milder treatment. It must therefore arise from the difference in the nature of the duties performed by the two corps. The enquiry in a therapeutic point of view is of great importance, since as medical men we know disease is much easier prevented than cured, that one inflammatory attack predisposes to another, and that such active disease leads to visceral obstructions, and that the nature of the remedies employed must in the course of time destroy the best habit of body, and induce debility and a broken-down constitution, and therefore indirectly lead to that heavy list of invalids, so loudly and so frequently complained of as originating in this country.

Much no donbt in the difference of habit or the men of the two corps, arises from the varied, the active, and the more incessant duties, and exposed exercises to be performed by the Dragoon. These lead to that high state of excitement, or robust and vigorous health, which in this country, I have ever observed so nearly allied to inflammatory disease, and which is so strikingly exemplified in recruits recently arrived from Europe.

That which irritates, stimulates, or excites, must induce disease. After much consideration, guided as it is by so limited an experience in this part of India, and making due allowance for those habits of inebriety and irregularity in which all European soldiers are so prone to indulge, I should say, that the predisposing and most frequent exciting causes of the great severity of our cases have been exposure to the sun, the parades and duties, the imperfect or deficient covering at night, and the nature of the clothing. When it is considered, that the whole of the above causes have more or less had their influence, it is only astonishing the corps is so healthy.

In every part of India, where I have served, some precautionary measures are established to prevent constant and unnecessary exposure to the effects of a noon-tide sun: here none exist. It is a curious fact, yet the deplorable and mischievous practice seems founded on the mistaken feelings, arising from the cool and refreshing climate of this station, and the comparative immunity to the sun's immediate effects, since the injurious consequences are not so suddenly apparent, as in other parts of the country; which has given a plausible and seductive motive for neglecting the salutary restraints which exist in the sister Presidencies. The very heavy list of hepatic cases alone in our hospital should dispel this delusion,

Much need not be said regarding the general parades and duties. It has already been stated, that the exercises of the Dragoon naturally lead to that high state of excitement bordering on disease. Therefore, it must be evident, that going a distance to church at the hottest season of the year, at ½ past 10 A. M. and returning at 1 P. M., together with the numerous barrack, congee-house, canteen, gram and hospital sentries, who are exposed to a vertical sun, cannot but prove injurious. Besides the regular morning and evening stables, there are line parades, field days, marching order, picquets, adjutant and riding-master's drills, foot parades, sword exercise, &c. even at this season of the year, together with between fifty and sixty non-commissioned officers and privates daily on guard; and they frequently mount, at 11 o'clock in the day, when the heat is great, and when both the old and new guards are thus exposed to the sun's influence.

The want of some suitable covering at night has given rise to frequent complaints, and is the great source in my opinion, of the numerous cases of rheumatism in the Regiment. The nights at this place are chilly, and at times very cool to the feelings; and I find all to whom I have spoken on the subject coincide in the observation, as well as the comfort, nay, necessity of having one or two blankets. Yet the Dragoon sleeps on a boarded bed, with merely a mat under him;

and a light cotton setringee* over his person—a very inadequate protection against the cold chills at night, and the sleeping, as is often the case, in a current of air, or opposite to a door, perhaps, after protracted sickness, or acute visceral disease, in hospital.

The last subject I shall note, is the frequent, I might say, nearly constant use of the warmest clothing of our northern climate of England, for the soldier in this debilitating and relaxing country. It must and does act as a powerful stimulant. Science never dictated that which violates all the physical laws of a hot climate.

The following is the dress adopted in the Bengal Presidency.

Hot weather.	*Cold weather.*
From 15th March to 14th October. Cotton Jacket, Trowsers, and Forage Cap.	From 15th October to 14th March. Regimental Cloth Jacket, grey Trowsers, and black Cap.

The subject is deserving attention, when it is considered that the territories of Fort William, where every climate is to be found, extend from the Sea Coast to the Tibet mountains. There can be no necessity for adding to the discomforts of a climate, allowed by all to be so destructive to the European constitution. At Rangoon and Arracan, the Madras

* Setringee is an Indian quilt.

corps suffered fully as much as the Bengal regiments. It is therefore a mistaken notion, to suppose that an ascetic discipline in a cantonment, can add to the efficiency of active duties in the field.

The regimental cap is heavy, and during the heat of the day on sentry oppressive, and in the hot season by no means so eligible a covering as the forage cap. Indeed the same may be said of the heavy Dragoon boots on dismounted duties, and also of the dress jacket and girdle for some months in the year.

I merely allude to them as constant predisposing and occasional exciting causes of disease, and so far important to the medical inquirer, and therefore a legitimate subject of representation, being convinced that the motive must be viewed with indulgence, that has for its object the health of the soldier.

In continuation of the foregoing observations, the following quotations from my Quarterly Report for June may be added: "The greatest accumulation of acute cases occurred in April and May, and were imputed to exposure to the sun, &c." Mr. Job, the late Surgeon of the 13th Dragoons, observes in his Report, ending March, 1826. "Although the "climate of Bangalore is considered more genial to "the European constitution than other stations in "India, Hepatitis is more prevalent, owing proba-

"bly to individuals presuming on its mildness, and "not acting with sufficient caution in exposing them-"selves to the sun."

The dress worn by the soldiers is usually much modified in India. It is natural, that it should be so; for it is as unreasonable to clothe him here during the hot season in the warmest covering of the northern climate of England, as it would be to expose the light clad inhabitants of the burning plains of India to the cold of an English winter. Independently of its weight, it acts as a powerful stimulant, absorbing the sun's rays, and is constantly saturated with the perspiration from the person. The moment the soldier is relieved from his duty, or returns from his parade, he throws off his clothes, and usually selects the coldest spot to lie down on, and perhaps sleeps in a current of air. The check to the perspiration thus given is highly pernicious. Trivial as these circumstances may appear, yet experience has amply proved their importance in a therapeutic point of view.

In the Quarterly Report for September, it was observed, the most prevalent acute diseases have been dysentery, fevers, hepatitis, and rheumatism. Of the first (dysentery) there has been a slight increase, owing probably to the incessant rain, the frequently getting wet, and no bedding at nights. The same circumstances may account for an increase

in the rheumatisms, but the fevers and hepatitis have sensibly diminished in numbers, and in a most marked degree as to violence. The majority of the cases slight, and not requiring that very urgent and active treatment detailed in former reports. This I impute to the coolness of the air, and above all the absence of the sun and consequently less exposure—the great source in my opinion of bilious attacks.

In December's report, it was stated, Fevers, Dysenteries, Hepatic and Rheumatic affections, have been the prevailing acute diseases, yet they have been mostly mild and easily subdued. The ulcers, the boils, and the contusions have had nothing to characterize them except their frequency. Syphilis has nearly disappeared. The great diminution in the sick list, I am inclined to attribute to this healthy season of the year, also the men having got a thick cotton padded quilt, serving the double purpose by its folds of bed and blanket. Likewise to the duties having been more mild, and the great exertions of the commanding officer to prevent drinking. The men are paid daily, which powerfully contributes to this end, as it leaves but a small balance at the periods of settlement. For the thick cotton padded quilt alluded to, the soldier is entirely indebted to Doctor Strachan, and his great and indefatigable exertions on the subject.

The most prevalent acute affections have been Dysentery, Fevers, Hepatitis and Rheumatism. The Ophthalmia, the Cynanche, the Pneumonia, and Cholera cases scarcely deserve a note, and the same indeed may be said of the local and surgical complaints. The contusions, boils, ulcers, &c. are generally frequent, from the nature of a Dragoon's duties, yet seldom of importance in a professional point of view.

My sojourn is too recent, and my experience at this presidency too limited, to enable me to enter into any thing like a minute detail of any disease, the more so as my treatment has not varied from that which I had adopted in Bengal.

Dysentery.—This has been a highly acute affection, and treated as such, by copious and repeated venesections, leeches to the abdomen and the perinæum, large or scruple doses of calomel, often combined with ipecacuanha, and the latter sometimes by itself, or with gentian, or the blue pill. Frequent mild purgatives, especially the Ol. Ricini. Hot fomentations and the hip bath, emollient or ipecac. injections, blisters, &c.

Fevers.—These, though fully as violent and frequent as the dysenteries, have not been fatal. Indeed, few die of fever at Bangalore;—evidently arising from the nature of the climate, the elasticity

of the atmosphere, and its freedom from noxious exhalations. The very strong breezes usually prevailing must tend to disperse any such miasmata. By the records of the Corps, it appears, during a residence of about eight years at Bangalore, six cases of intermittent fever only have occurred, viz. 4 tertians and 1 quartan in 1823, and 1 quotidian in 1824.

Two cases have died out of 121 treated. One was a corporal from remittent fever, which was contracted in the passes between this and the Neilgherries, and the man had been ill eleven days ere he got to this station, or received any medical aid. He had been sent in charge of four men to the hills, for change of air, and in returning, having taken a wrong route, he got the fever which proved fatal: and the other death arose from an abscess in the brain.

The treatment has been strictly antiphlogistic, venesection, leeches to the temples, shaving the head, and applying cold wet cloths. Blisters to the neck, calomel, with purgatives, &c. to diminish arterial excitement or local determination; subsequently alteratives, saline diaphoretics, tonics, &c.

Hepatitis.—This I consider a most important disease at this station, whether viewed as to its frequency, its fatality, or its injury to the constitution.

In previous parts of this report, endeavours have been made to account for its frequency at Bangalore.

Medical writers of considerable repute have considered hepatic diseases as endemial to certain parts of the Madras territories; and particularly Doctor James Johnson, who is supported by Mr. Annesley, and supposes its frequency to be attributable to the nature of the soil and seasons, causing the high medium annual average temperature which prevails in the Indian peninsula.

Thus Doctor Johnson observes:

"The nature of the soil is such, that while the sun is above the horizon, it acquires a much superior degree of temperature to that which the plains of Bengal attain, in consequence of which the nights are often hotter than the days, when the land winds prevail in May, June, and July." Again, "Many causes combine to produce so much higher a range of atmospherical heat in the Carnatic than in Bengal —First, the coast in question trends away towards the equinoctial line, while a great part of Bengal lies without the tropics. Secondly, the soil of the former is gravelly or sandy, and vegetation stunted; whereas, that of the latter is clayey, and vegetation

luxuriant. Thirdly, the periodical rains that fall at the change of the monsoon, on the coast, are instantly absorbed by the parched and sandy surface, affording only a very temporary coolness to the air, while an actual and extensive inundation cools Bengal for months together. If therefore the nocturnal temperature of the two places were blended with the diurnal, if for instance, the Thermometer were marked every hour at Madras and Calcutta, throughout the year, and the whole averaged, there would be full ten degrees difference in the annual mean temperatures of the two presidencies. Bombay is nearly on a par with Calcutta; for although the country surrounding the former is neither flat nor inundated, as in Bengal, yet its northern parallel of latitude, its insular situation, and the mountainous nature of the adjacent country, combine to render the annual temperature of Bombay as low, if not lower, than that of Calcutta." Again, it is stated, "Knowing then, as we do, how uniformly a high temperature affects the biliary organs, and keeping the foregoing facts in view, can we be at a loss to account for the greater frequency of genuine Hepatitis in the Carnatic, than in Bengal?"

Mr. Annesley, besides enumerating a great variety of exciting causes, agrees with the views of Doctor Johnson, and says, "The greater prevalence of

hepatitis and dysentery amongst the European troops in the Madras, than the Bengal presidency, seems in some degree to be owing to the greater warmth of the climate and to the excessive use of deleterious and intoxicating liquors*." At page 152, regarding Bangalore, he observes, "This is one of the most temperate and healthy places in the Indian peninsula. In the year 1800, the Thermometer was observed not to rise higher than 82°, nor to fall lower than 58°." Again at page 160, in the Table for the year 1821, there are, of 2043 Europeans in Mysore, 605 admitted with Hepatitis, and 28 deaths;—and of admissions,

The Centre Division,	has 35	per cent. of	Hepatitis.
Presidency,	has 34	do.	do.
Mysore,	has 30	do.	do.
Travencore,	has 21½	do.	do.
Dooab,	has 16	do.	do.
Southern Division,	has 15½	do.	do.
Ceded Districts,	has 14	do.	do.
Hyderabad,	has 8½	do.	do.
Nagpore,	has 6½	do.	do.
Northern Division,	has 6	do.	do.

So that, notwithstanding Bangalore being one of the "most temperate places," still with the exception of the centre division and the presidency, there is more Hepatitis than at any other division of the Madras army.

* Vol. i. page 401.

The high rate of the diseases for the presidency is accounted for by the "number of cases removed there from other stations, either for change of air or for the purpose of being invalided, or in order to embark for Europe."

Therefore Bangalore may be looked upon as peculiarly subject to Hepatitis ; nor can this be accounted for, from the high prevailing temperature, since the medium range of the Thermometer, as extracted from the records of the corps, would give but an annual average of 74° for several years together.

Table of mean Monthly Temperature since 1820, *extracted from the returns of the regiment.*

Months.	Bangalore, 1820.	Bangalore, 1821.	Bangalore, 1822.	Bangalore, 1823.	Bangalore, 1824.	Bangalore, 1825.	Bangalore, 1826.	Arcot, 1827.	Arnee, 1828.	Arnee, 1829.	Bangalore, 1830.
January,.....	„	67	69	70	73	72	69	74½	74	79½	66½
February, ...	70	74	78	71	76	77½	76	76½	75½	79	72½
March,.....	74	76	80	75	78	84	80	82½	82½	83½	77½
										*Bg.	
April, ...	78	79	79	82	80	86	81	87½	89	86	80
May,.....	76	78	78	82	80	83½	81	85¼	93	82	78½
June, ...	72	77	76	76	79	78½	74	88½	91	79	76¾
July,.....	70	74	73	75	78	76½	Mar.	87⅝	88	77	74½
August, ...	71	72	73	74	77	77	Mar. Arcot.	85½	88½	75	72¾
September, ...	71	72	73	72	78	77	84	83½	87½	74½	72¾
October, ...	72	71	74	74	75	74	83½	78½	85	73	73¾
November, ...	69	69	70	75	72	73	78	78	81½	75	73¾
December, ...	68	71	68	74	70	74	73	74	74½	71½	70½

* Bg. (Bangalore.)

Another curious circumstance is, the total exemption of children from hepatic disease, the immunity the Natives* experience, and the very few cases amongst the soldiers' wives.

For out of an average aggregate of 59 women, there have been but 33 cases treated in 11 years, and this too inclusive of nearly three years in the Carnatic, at Arcot and Arnee. Whence this exemption? In point of diet, lodging, and even drinking there could be no great difference between them and the men; as soldiers' wives in India are notorious for their inebriety, irregularities, and incontinence, powerful sources of hepatic disease all over the world. This will be best illustrated by the following list of this disease for 11 years:

In 1820, at	Bangalore,	out of 63	women,	7	Hepatitis and	2	deaths.
1821, at	do.	of 60	do.	6	do.	1	do.
1822, at	do.	of 51	do.	3	do.	1	do.
1823, at	do.	of 54	do.	0	do.	0	do.
1824, at	do.	of 49	do.	1	do.	1	do.

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* Dr. Ricks informs me, that of 160 average number of native Artillery-men at Bangalore, in 5¼ years, there has not been one case of Hepatitis; only 15 of Fever, and 39 of Intermittent Fever, including 7 relapses.—*Vide General Abstract of the Returns of the Native Troops for* 1827, 1828, 1829, *and* 1830, *as published by the* Madras Medical Board.

In 1825, at Bangalore,	out of	56	women,	3	Hepatitis and	0	deaths.
1826, at do. & Arcot,	of	46	do.	2	do.	0	do.
1827, at Arcot,	of	45	do.	5	do.	0	do.
1828, at Arnee,	of	70	do.	2	do.	1	do.
1829, at Arnee & Bangr.	of	71	do.	2	do.	0	do.
1830, at Bangalore,	of	85	do.	2	do.	0	do.

Therefore, high temperature alone will not account for the frequency of hepatic disease at this station, since it must have affected the women. Whereas amongst the men its seizures have been uniform and numerous.

Thus: in

1820,	there were	669	men,	99	cases and	6 deaths.
1821,	do.	647	do.	81	do.	4 do.
1822,	do.	656	do.	75	do.	8 do.
1823,	do.	647	do.	101	do.	4 do.
1824,	do.	651	do.	113	do.	6 do.
1825,	do.	648	do.	89	do.	7 do.
1826,	do.	630	do.	89	do.	2 do.
1827,	do.	586	do.	159	do.	10 do.
1828,	do.	525	do.	89	do.	4 do.
1829,	do.	566	do.	71	do.	8 do.
1830,	do.	631	do.	75	do.	3 do.

If Hepatitis were endemic, why not like fever and dysentery attack all ranks, Natives as well as Europeans, and include the women and children*. If it

* Since this was written, I have seen one child with diseased and enlarged liver, running into abscess; but which soon got well on being punctured.

arose from high atmospherical temperature, why make the same exemptions, and again why afflict Madras and not Bengal and Bombay, where the mean annual temperature is much higher than in Mysore, celebrated for its delightful climate, its cool nights, and its refreshing showers during two monsoons in the year.

From the 1st of May to the 20th of June, the following is the comparative scale of admissions of acute cases in the Royals and 13th Dragoons.

	Strength.	Fever.	Cynanche.	Ophthalmia.	Splenitis.	Peritonitis.	Gastritis.	Hepatitis.	Rheumatism.	Dysentery.	Enteritis.	Pneumonia.	Catarrhus.	Epilepsia.	Diarrhœa.	Cholera.	Dyspepsia.	Cephalalgia.	Total.
H. M. 13th Dragoons,	606	21	3	8	2	„	„	20	7	31	1	„	„	1	5	5	„	1	105
H. M. 1st or Royal Regiment,	860	7	„	„	1	1	1	7	4	18	„	1	2	„	1	„	1	„	44

I have already detailed the nature of the duties, &c. of the regiment; therefore could this disparity of seizures in the two Corps at the same cantonment, so marked even in the short space of six or seven weeks, arise from that source? In point of sobriety, regularity, and good conduct, it is admitted by all that the Dragoons were fully on a par with the Royals.

Clearly, therefore, there must have been some cause for so marked a difference in the seizures in

general, and of Hepatitis in particular; and as those assigned for the latter affection, by the best authorities, so far from being correct, are positively refuted, in as much as high temperature is concerned at this station: as Hepatitis rarely affects the Natives, and in a very small proportion the European women; we must look to other sources for its frequency at Bangalore.

Invidious as may appear such comparisons and parallels, yet it is the only mode of arriving at correct data, as to the real exciting causes of sickness, and thus ultimately leading either to the prevention of disease or checking its progress.

BANGALORE,
1*st October*, 1831.

A SKETCH

OF THE

MEDICAL TOPOGRAPHY OF GOWHATTEE,

AND

AN ACCOUNT OF THE

PREVAILING DISEASES OF THE NATIVES

AT THAT STATION.

By JOHN LESLIE, Esq.

Presented 2d July, 1831.

Gowhattee or Ouragattee, the capital of Lower Assam, is situated on the left or southern bank of the Burrampooter, in Lat. 26° 11′ 30″ North; and 97° 6′ East longitude. It is 66 miles east of Goalpara, to which place the road is only passable during the cold and dry seasons. To the eastward there is a bund* which serves as a road leading to Ghergong, the old capital of Assam; but this not having been kept in repair, is in some places scarcely passable. The distance from Calcutta is about 500 miles, and the ordinary mode of communication by water.

Opposite the town, the breadth of the river, during the rains, exceeds a mile. In the cold season, an

* Bund, is a broad raised embankment or mound.

irregular bank about a quarter of a mile in breadth is left dry; this, like the bed of the river here, is sandy, though there are rocky points both in the bed of the river, and at the foot of the banks where these are steep.

The rise of the Burrampooter is irregular; it is lowest about the end of December, or in January, and continues nearly stationary till March, attaining its greatest height some time in August. During September, it usually falls and again rises several feet; in October and the succeeding months it falls rapidly. The average rise is about 30 feet; the greatest rapidity of the current $4\frac{1}{2}$ miles, and the average rate three miles per hour, during the rains, (at some particular points, where the stream is interrupted by projecting rocks, of course more rapid,) and during the cold season from two to two and a half miles per hour. Its depth when lowest is from three to four fathoms opposite to Gowhattee; and there, in the middle of the river, stands a small rocky islet, about 240 yards long and a couple of hundred in breadth, thickly wooded, and about 40 feet above the highest rise of the river: near the top is one of the numerous pagodas for which this place is remarkable, its gilded spire and dome peeping through the foliage which partially conceals it.

In an area about three miles in circumference near Gowhattee, two-thirds of the ground, during

the wet season, is under water, in consequence of the overflowing of extensive jheels behind the town. There are two large tanks and numerous small ones at this station, but these are chiefly used for bathing, and by no means kept clean: there are no wells. The site of most of the houses is swampy; and there are deep ditches on either side the roads, containing water in a stagnant state.

The hills in the neighbourhood of Gowhattee are numerous, of different heights, and running in various directions; some are insulated and sloping, others extending in lengthened ridges, and rising abruptly from the plain; these last chiefly affect a north-easterly direction: all are thickly wooded, even where most precipitous, but here and there a large bare surface of granite rock is visible. To the south, the hills form a sort of irregular amphitheatre, those to the east and west, close to the river, rising about 600 feet; the back ground is formed of unconnected hills and lengthened ridges, the former from 300 to 700 feet, and the latter perhaps exceeding 800. Openings between these ridges lead to extensive valleys, or rather flats: for the hills rise abruptly from the plain on either side, and the view in this direction is skirted by the Kassyah mountains about 30 miles distant.

To the north, on the opposite side of the river, the view is more open, the hills here of various heights, and lie all in a N. E. direction: there are some few

insulated knobs which rise from 60 to 100 feet, the higher ranges are from 5 to 600 feet. The prospect in this direction is bounded by the Lower Bootan range, about 30 miles distant; and in a clear day, the snowy peaks of the Himalayahs, distant above 100 miles, are distinctly visible.

The hills are all composed of red earth and granite rock. The common trees are the mango, the jack, the citron, lime, and orange trees; the semil or cotton tree, the koojee-tanga, a fruit tree of the plumb sort; the jookea-tanga, kudum, &c. &c. On the tops of the hills are stunted semil trees.

The climate may be generally described as very moist, and not unlike what prevails in the eastern islands. During the cold season, which extends from the end of October to March, dense fogs prevail, frequently not clearing off till 9 or 10 A.M., and sometimes an hour later. These do not extend above 10 miles on either side of the river, and are evidently caused by the atmospheric moisture being condensed by the cold current of air above the river, the water of which is at all times of a low temperature. The winds at this season are easterly, and this indeed is their prevailing direction in Assam throughout the year. The course of the river is nearly E. and W. in the vicinity of Gowhattee; and the tract of country on each side consists of extensive sand-banks, rich alluvial land, and wooded hills, with

numerous jheels and rivulets intervening. The thermometer during these months ranges in the day time from 58 to 72°. Showers occasionally fall, and generally some heavy rains, during February. The cold is not so intense as to render fires necessary, as in the western provinces, about the same latitude.

In March, there are violent north-westers, the wind strong, and blowing in gusts, frequently occasioning much damage. In March, April, and May, there are thunder storms, but seldom at a later period. I believe no accident from lightning is known to have occurred in Assam.

The seasons in Assam may be divided into the cold, and wet; for in April and May, the rains commence, with intervals of fine weather. During July, August, and September, the heaviest showers fall; but even in these months there are dry days, and the rain seldom falls for 24 hours without intermission, and scarcely ever for two days.

The range of the thermometer is from 80 to 86°, seldom rising in the shade to 90°, and the nights are almost invariably cool. Westerly breezes for a few days are occasionally experienced, but we seldom observe the wind to blow from the north or south. Different atmospheric currents are at times distinctly visible, the higher clouds progressing to the eastward, whilst the wind blows from that quarter.

The following is the annual range of the Thermometer during the day time.

Annual mean temperature, ...			72°86
January extremes ..	48° to 73°	July extremes .	76 to 89
Mean temp.	58°15	Mean	82°15
February ext.	48 to 80	August ext. ...	74 to 91
Mean	60°7	Mean	81°52
March ext.	52 to 90	September ext. .	70 to 90
Mean	72°09	Mean.....	81°55
April ext.	60 to 90	October ext....	67 to 87
Mean	74°8	Mean.....	77°45
May ext.	60 to 92	November ext. .	58 to 81
Mean	76°48	Mean..	71°
June ext.	70 to 91	December ext...	49 to 73
Mean	76°5	Mean....	61°98

The soil in the vicinity of Gowhattee is a dark mould, varying in thickness from a few inches to several feet: beneath this is the red clay, extending from the hills; far to the eastward and southward, where there are extensive levels, it is not observed. The clay rests on coarse sand, which chiefly forms the bed of the river. On the banks of several of the numerous rivulets, a fine blue clay is found lying beneath the red, and resting immediately on the sand. The stratum varies in thickness, but is usually from 2 to 3 feet.

The agricultural productions in the vicinity of Gowhattee are confined to rice, pulse, Indian corn, mustard seed, sugar-cane, a few vegetables, cotton,

the poppy and some tobacco. The areca and cocoa palms are cultivated, but their produce is very scanty.

The peculiar manufacture of the opium deserves a few remarks. The white variety of poppy is most generally cultivated; it ripens in February, and the exudation from the wounded capsule is wiped off with a piece of old rag. This when saturated is rolled up and successive layers applied, until a mass be obtained of about a seer in weight. The opium in this state is called *kanee*, and to its use, or rather abuse, the Assamese are unfortunately exceedingly addicted. The drug is used in two modes, one method is by daily dipping a portion of the rag in water and drinking the solution; the other is, to strain and evaporate the solution, so as to obtain a pure extract of opium, which those who can afford it, smoke. The latter mode is chiefly confined to the higher classes, and is similar to the practice of the Chinese.

The kanee, when cheapest, shortly after the harvest, sells for 8 Rs. per seer, but at a later period sometimes fetches double this price. Its use in any shape is said not to be of longer standing here, than the commencement of the present century, and its introduction is attributed to the Company's sepoys.

The cultivation of the mulberry, and the rearing of silk-worms, has been for some time known in Assam,

but as yet the quantity of silk produced is trifling, although there exists no obstacle to its indefinite increase, except the want of capital, and disinclination to exertion on the part of the Assamese. The Agent to the Governor General has caused some mulberry plantations to be raised at Dhurony, which are in a thriving state, but the produce in silk is as yet inconsiderable; it is besides carelessly wound, and in consequence of less value, from inattention of the workers to its manipulation. The Moogah moth, a very large species, is bred in considerable numbers by the Assamese; and the Moogah of a strong and durable texture, both as thread and stuffs, forms an important item of their exports.

There are large herds of cattle in Assam, but of a wretched breed; they are small, and give a very scanty supply of milk. Some tame buffaloes are kept chiefly for their milk, and are occasionally used in husbandry. The country tattoos or ponys appear to be a degenerate race from the Bhootan breed. Sheep do not thrive in this part of the country: but goats are numerous, and those intended to be fattened for market are commonly castrated. Hogs are bred by the Cacharies; and poultry is procurable in tolerable abundance.

During the cold season, there is a good supply of fish, but few of any size are caught during the rains. The fishing is performed by hand nets, let

down or raised by long bamboos at the edge of the stream.

Wheel-carriages being unknown in Assam, the roads for the most part, excepting the old bund-roads, are mere pathways, and even the bund-roads where not much frequented, are wholly overgrown with jungle. The bridges, which are necessarily numerous though small, are exceedingly rude, consisting of a few posts with fresh planks laid across, and the whole covered with twigs and earth; these of course are constantly giving way, but this occasions slight inconvenience where there are few but foot passengers.

The population of Gowhattee may be estimated at 60,000, there being about 11,200 houses. From the straggling character of the town, it is difficult to state the extent of ground occupied. It appears to be increasing; perhaps about $\frac{1}{12}$ of the inhabitants are not Assamese. The town occupies an irregular space, upwards of a couple of miles in length, but in few parts of any great breadth, and running from the most part parallel with the river, which here forms an angle. The houses are in some parts separated by wide intervals, but in others huddled closely together. They are formed of wooden posts, bamboos, reeds, matting, and grass roofs. The public buildings are composed of the same mate-

rials ; and with the exception of the Hindoo Dewuls, the magistrate's residence, and a record office, now in progress, there are no brick buildings at Gowhattee. The native houses are but slightly raised from the ground, and but few are furnished with a machaan* flooring. No care is taken to keep the adjacent ground clean, or free from jungle, and a quantity of filth gradually accumulates near each house. Little attention appears to be paid to drainage, and the deep ditches serve merely as reservoirs for stagnant waters. The site of many of the houses is several feet below the level of the road, which being a native work, and very old, is well consolidated ; the surface only becoming muddy after heavy rain. Some of the native huts are formed of reeds plastered with the fine blue clay ; this mode however, though giving a neat and comfortable appearance, is not generally adopted.

The jail is a large and well constructed building, situated on the bank of the river, near the western extremity of Gowhattee ; the enclosure within and its vicinity are kept perfectly clean, and from its nearness to the river, there is every facility in procuring water ; the bank here is low, and during the height of the rains the river approaches to within 100 yards of the building. The interior is furnished with a

* Machaan is a bamboo frame-work, used for raised floors in damp situations.

well-raised machaan or bamboo frame-work, and the whole is calculated to afford comfortable accommodation to its inmates, varying in number from 3 to 400. Thus, but a small portion of the Gowhattee convicts are located in the great jail, and the other buildings appropriated for their reception are of an inferior description.

Until very lately, the jail hospital consisted of two low buildings, with a single out-house, in a small enclosure adjacent to the jail. These buildings were in many respects ill adapted for the proper accommodation of the sick; and the hospital has been since removed to a more eligible site. It now occupies a piece of elevated ground near the angle formed by the river, and is of sufficient extent to house above 100 individuals.

On the western side of a small river, bounding Gowhattee, in this direction, are two brick arched gateways, the remains of the exit and entrance to the Rajah's palace; which building, with the exception of its basement, has wholly disappeared, the house having been set on fire by the Mauns during their late invasion, and the bricks having been subsequently removed. The gateways are not exactly alike, one is a good deal more dilapidated than the other; they are about 12 or 16 feet wide and 18 long, the masonry appears very ordinary.

About a couple of miles further, in this direction, is a short tunnel or brick work, rounded, and about 24 feet long and 10 wide; the tunnel is formed through a ridge that crosses the gorge of the narrow wooded valley, along which the road here winds, and doubtless this was in former times a fortified barrier or pass. Beyond the gateways described, and the top of the hill bordering the rivers west of Gowhattee, stands the famed Kyraia hill, a temple still deemed by Hindoos a place of peculiar sanctity, and to which pilgrimages from distant parts of India, continue to be performed. It appears chiefly worthy of remark, on account of a stone causeway leading up the hill, and formed of large granite blocks, evidently a work of immense labour, and which the present inhabitants of Assam appear wholly incompetent to execute.

The clothing of the poorer orders is stated to be of the yearly value of one rupee twelve annas, to two rupees: consisting of a couple of body cloths *(dhotees)*, at four annas each, a sheet *(chudder)* value eight annas, and a wrapper or *gilof*, from 12 annas to a rupee in value; their bed is a piece of mat, and usually on the ground. The clothing just described is undoubtedly insufficient for this climate during the cold season, when the dews are heavy.

The fuel consists of dried twigs picked up in the surrounding woods, seldom of wood cut up for the

purpose, although the blocks might be had for nothing. The indolence of the Assamese is so great, that they prefer a tedious walk to the labour of cutting up wood close to their houses. Some of the old trees, planted along the principal road, having been blown down, were only removed by the order of the magistrate, as no one would (as in other parts of Hindoostan) take the trouble to cut them up for fuel.

The diet of the poor is very meagre. It consists of rice, seasoned with *khar*, (an impure corbonate of potash, procured by mixing the ashes of their fires with water, which is then filtered through a bamboo funnel and thus used; sometimes the salt is procured by evaporation.) About once a week they use a little salt, and a few vegetables or wild fruits procured in the jungle, cooked with oil, turmeric, and garlic; they are also very fond of fish, which is frequently eaten when in a semi-putrid state. The expense varying from one to two rupees per month. The peasantry however, and the Assamese, in general, are mostly agriculturists, and if industrious may live better than above described.

It is not easy to state the amount of wages in Assam, as many hold their lands on the tenure of personal service, and the principal land proprietors have their grounds tilled by slaves. A majority, however, of the peasantry hold their lands on the pay-

ment of a moderate assessment, one rupee per *poorah*, nearly equivalent to an acre, which however does not include the whole of the demands made on the cultivators, there being various local assessments for purposes of police. The lands appropriated to the support of religious establishments are held at a lower rate.

The useful arts are in a very backward state in Assam. Even in agriculture no great progress has been made. Wheat is not grown, though the soil in many places is perfectly adapted to its cultivation. The sugar-cane only furnishes the Assamese with treacle or jaggery, the preparation of sugar being unknown. Bullocks are not used as beasts of burden, and wheel-carriages of any description are not in use. All burdens by land are carried on men or women's shoulders; the women perform much of the laborious duties, and in consequence, at an early age look haggard and become hard featured. The mechanical arts are in a very rude state, and beyond the commonest workmanship in iron and wood they seem to be little cultivated. The dilatory proceedings too of these coarse workmen are not a little vexatious.

Before adverting to the state of morals and amount of crime in Assam, matters which have a close connection with disease, and its consequent mortality, a few brief remarks may be made on the various

races and tribes who at present compose the inhabitants of Lower Assam. Under the jurisdiction of a single magistrate is placed Lower Assam, comprehending about 4,100 square miles: bounded on the north by the Bhootan hills; to the south by the Garrow and Kassyah ranges; on the west by the Monass river; and to the east by Bissnauth; and containing 350,000 inhabitants.

The higher class, the Ahums, are generally tall and fair complexioned; these are the descendants of the conquerors of Assam in the 14th century, and who came from the eastern country bordering on China. They form a limited class, and profess Hindooism. During the reign of Aurungzebe, Assam was invaded by the Musslemans, who, however, only retained possession of Upper Assam for three years; in Lower Assam, they retained power for a longer period. Their descendants, now a degraded class, are termed Gooreahs, and profess Islamism.

The character of the native Assamese may be described as evincing extreme timidity, submissiveness, and much apathy, coupled with gross ignorance and immorality. To this general character, however, a few of the tribes furnish striking exceptions. Their forms also vary much; whether tall or short, they are generally slender, with small and often delicate features, which may be contrasted

with the robust and brawny Cacharies, who are not unfrequently of gigantic proportions.

The Assamese tribes may be enumerated as Brahmins, Koleetahs, Quoits, Jogees, Dooms, Koomars, Hieras, Kochs, all professing some corruption of the Brahminical faith. The Rabuhs and Cacharies are distinguished, more especially the latter, by their strength and industry; they are supposed to be descended from hill tribes; they are proud, fond of good living, and somewhat given to excess: they pay adoration to an evil spirit, and firmly believe in witchcraft: the belief in which, however, is not confined to the Cacharies in Assam. Besides those just enumerated, there are several less important subdivisions. All are husbandmen, but the Jogees also weave and breed silk-worms; the Dooms are fishers; the Koomars and Hieras fashion earthen vessels. The Cacharies are distinguished as cultivators; they breed hogs, weave mats, and distil intoxicating beverage, prepared from rice fermented with *bakar*. They use an earthen vessel with a bamboo tube for a worm; the spirit is exceedingly nauseous, and both men and women indulge in its use. They abhor milk, and do not use it in any shape.

There are also Brahmins attached to the various temples, who are said originally to have come from Seeuhpoor, and who have now frequent intercourse with Benares. Besides the Bengalees, a number of

Jains are here settled, an enterprizing mercantile race, originally from Joudpoor, Marwar, and Hurrianah; who have settled in most of the larger cities in northern Hindoostan, and carry on their traffic, chiefly, as agents from the establishments at Dacca and Calcutta.

At Gowhattee, besides the various tribes enumerated, there are men from Munipoor, Rajbunsees from the Gowalpara district, and Nepaulese, all soldiers in the Assamese Light Infantry; there are also two companies of Hindoostanee sepahees, whose tall and handsome figures contrast strikingly with those of the Assamese. Having for a particular purpose been engaged in taking accurate measurements of a good many Natives, and thus having an opportunity of seeing them divested of their dress, I was struck by the fact, that few appeared handsome. The women of Camroop, however, bear a high character for beauty of person, but of this I cannot speak. To give a correct account of the physical characters of the Assamese tribes would extend this paper to too great a length, and may perhaps be worthy of a separate consideration.

Crime prevails to a great extent, and thefts are committed on the most trifling temptation, or casual present gratification. The addiction to opium is one great cause of the frequency of theft. The unhappy

wretches, debauchees in this drug, sacrifice every thing to the means of procuring their accustomed gratification, and the want of opium *(kanee)* is frequently assigned by prisoners as the cause of their crimes. The mortality so prevalent in the Gowhattee jail arises in a great measure from this cause, and is chiefly confined to this class of offenders, whose constitutions are frequently irreparably injured by the abuse of this method of intoxication.

The state of the poor, where the majority are in low circumstances, is of course very wretched. The Bengalees are accused of thrusting forth their servants when very unwell, and the number of dying wretches admitted to the jail hospital under the general term of *moosafirs*, or way-faring people, gives much colour to this assertion. I myself doubt if this inhuman practice be confined to the Bengalees.

PREVAILING DISEASES.

The remarks now about to be offered must be understood to apply chiefly, if not wholly, to the jail diseases; my experience being almost exclusively confined to the cases in the jail hospital.

The ordinary jail diseases are fevers, bowel complaints, dropsy, ulcers, venereal, and cutaneous affections. With reference to the swampy site of

Gowhattee, and from the character of the adjacent grounds, it might be expected that Fevers would prevail. In the ordinary intermittents, where no urgent symptoms are present, a solution of sulphate of magnesia or soda, with tartrate of antimony, is exhibited; and after the operation of this medicine, the cure is completed by the use of some light bitter infusion. Bleeding and purgatives, however, are not unfrequently necessary, and many cases are accompanied by tumid spleen. Remittents are not unusual, and these in a large proportion of cases, proved fatal. Delirium, or rather a kind of imperfect coma, often preceded death. The treatment in these cases is of course more active; general bleeding, leeches, purgatives, calomel, and blisters being resorted to.

Fevers often usher in that intractable form of bowel complaint, from which so large a proportion of the mortality of this jail originates. This disease has its seat in the great intestines, and its approach is frequently overlooked; and emaciation to a considerable extent occurs before the patient applies for admission into hospital. In not a few cases, a patient admitted with ulcer is observed gradually to lose flesh and strength, without making any complaint except that he feels weak. On closer questioning, he will admit that his bowels are loose, though the dejections, in frequency, may not exceed twice a day. After a time, small clots of blood appear in the stools,

which are of a light yellow or reddish colour, of thin pultaceous consistence, and very fœtid. In more acute cases, mucus and blood are discharged from the commencement of the illness, with straining and tenesmus, sense of heat, and sometimes soreness below the navel. Thirst and loss of appetite for food are attendant symptoms; the pulse is increased in frequency, and the skin is occasionally hot. At the commencement, the tongue is coated; but as the disease advances, it becomes red and smooth. Emaciation progresses, the symptoms become less acute, the pain perhaps entirely ceases, but the patient is evidently losing ground; the dejections continue frequent, and œdematous swellings in the hands and feet now occur. The discharge from the bowels continues yellowish, and of a creamy consistence, or perhaps becomes almost entirely a bloody liquid. In cases attended with much anasarca, the watery accumulations are frequently removed a short period before death, by numerous liquid stools; and the bodies in these cases exhibit a degree of emaciation I have never elsewhere met with.

The duration of the disease is extremely different in different cases; varying from many months, to a very few weeks; and this is by no means satisfactorily accounted for by post-mortem examinations. In several cases of speedy demise, the lesion discovered was slight and recent; and in others of great standing, it has appeared difficult to under-

stand how life could be supported under such extensive disorganizations. Of the appearances disclosed on the examinations of those dying of this disease, a short summary will suffice: the details of the appearances in 47 cases being given in the Appendix.

In many cases the fat usually found in the omentum is wholly removed, and this membrane is exceedingly shrunk; the small intestines are of a pale colour and thin, but rarely exhibiting any traces of increased vascularity, in other cases: both omentum and small intestines are of perfectly natural appearance. The colon, is generally unaltered on its peritoneal surface; its mucous membrane is found to exhibit alterations from the natural state, varying from a slight inflammatory blush to deep ulcerations, or even gangrene; not unfrequently the rectum displayed a greater change of structure than the colon. To proceed more in detail, in certain cases, the mucous coat of the colon exhibited no alteration of structure; in others were observed a reddish blush, the surface of the gut smeared with purulency, and a few superficial ulcerations or abrasions more distinct towards the rectum, or confined to that intestine. Again, without much increased vascularity of the villous surface, the whole would be studded with numerous minute ulcerations, evidently of a chronic character: in others the villous coat would have a dark uniform purplish blush; the membrane thickened, irregular, and soft, and either in the colon

or rectum, generally in both, there were some deep ulcers. In one instance, the ulcer was found to have penetrated the peritoneal coat of the intestine: and lastly, both omentum and colon have been found gangrenous. In a single instance, the mesocolon was found vesicular; but in no instance was disease of the mesenteric glands discovered. The liver, stomach, and spleen were generally healthy. Serum to a moderate extent was usually found in the abdominal cavity; in two instances, where it existed in considerable quantity, the surface of the spleen was found white and corrugated, like skin long steeped in hot-water, or pickled tripe. In the anasarcous cases, several ounces of fluid were always found in the pericardium; the viscera in the thoracic cavity were generally healthy.

The causes which tend to produce so much sickness and mortality at Gowhattee have been already adverted to. They may be enumerated in the following order:—The vice, ignorance, and poverty of the lower orders, and consequent deficiency of food, bad clothing, depraved habits, &c. the locality of Gowhattee, the addiction to opium, and lastly, until very lately, the extremely defective system of hospital management, as regarded the accommodation, clothing, and feeding the sick: some weight must also be allowed to the very deficient state of the medical stores, during the whole of the year 1830. It must also be borne in

mind, that generally the patients admitted to jail hospitals consist chiefly either of young men of debauched habits, or old and worn-out individuals. With an average number of sick, at the least exceeding thrice that of a native regiment, no greater number of native doctors is allowed, and the servants are merely convicts, a few only of whom receive a small remuneration. In consequence of this state of matters, it has occasionally been found scarcely practicable to pay that degree of attention to individual cases which was often required.

The convicts of Lower Assam being located in various jails, it has not seldom occurred, from the neglect of the respective superintendants, that cases have been received into hospital in the last stage of disease, and the result of medical treatment in consequence exhibited in too unfavorable a light. I represented this subject to the magistrate, and the strictest orders have in consequence been issued to send all cases immediately to hospital, however apparently slight; and it is from this circumstance that disease appears from the numerical returns to have increased since the commencement of the year. Still, however, cases are occasionally received at an advanced period of disease, and it would appear desirable that the medical officers, or at least a native doctor, should be furnished with the means of periodically examining the state of the convicts at these stations.

Of bronchocele I have seen a good many instances, but in none was the enlargement of the gland very great. In several which came more immediately under my observation, iodine, in the form of tincture and ointment of Hydriodate of Potass, was successfully exhibited. Small-pox and cholera have at different periods prevailed epidemically, and generally cause great mortality. Small-pox is at present prevalent; inoculation is practised by the Assamese. Of cholera in Assam my personal experience has been extremely limited; a few sporadic cases only having occurred during the whole of last year. Leprosy is by no means uncommon.

In the early part of the year I recommended and pointed out the site for the present hospital, but this building made very slow progress. In the latter part of August, I removed several of the worst cases to an hospital erected on the banks of the river, about eight miles below Gowhattee, on an open plain, and this measure was certainly attended with advantage. This building is still kept up as a convalescent station, and the men are employed in light gardening work for their own benefit.

Messing has since that period been established among the prisoners, and the introduction of *kanee* strictly prohibited. The present hospital, being completed, the accommodation for the sick is good, and of sufficient extent. The worst cases are sup-

plied with cots and extra blankets, with men ordered expressly to assist them; and they are placed in an enclosed verandah apart from the others.

The bodies of those who die are generally examined as a matter of course, and cases are kept in *Persian* by one of the native doctors, and abstracts of these are entered in the hospital books in English. The post-mortem examinations which have been made throw some light on the nature of the Dysentery which affects the poorer natives of this part of India; but the discrepancy already adverted to, of men dying where no apparent or only very slight lesion exists, is not accounted for.

Shaik Hussen Ally, the native doctor, to whom I at present allude, has throughout shown himself most indefatigable and attentive; he had charge of the separate hospital at Kanamodh, and examined and drew up the records of the appearances on dissection of many of the cases noted in the Appendix, during my unavoidable absence. As an instance of his zeal for the acquisition of professional knowledge, I beg to mention, that he has lately commenced writing an account of the muscles, stating the origin and insertion of each muscle as found on dissection by himself. This idea was entirely spontaneous, for I should never have proposed such a labour to him.

I shall now briefly advert to the result of my experience in the treatment of Dysentery. Opium in any shape I consider decidedly injurious; and as a mere palliative, the relief afforded is not great. In all cases, where pain and soreness is complained of, with a frequent, small, and often sharp pulse, although the patient may be much reduced, I resort to bleeding, and in these circumstances rarely without relief, the blood being buffy, firm, and cupped. Ipecacuanha I consider the most important remedy, and having lately been obliged to exhibit it alone in three and four grain doses, made up with soap, from the total want of any bitter extract, I have not found it render the stomach irritable: it is certainly, however, desirable to exhibit the ipecacuanha in larger doses, and in combination with Extract of Gentian it is a good remedy. In the more acute cases, and at the commencement of the disease, after the requisite depletion has been employed, calomel with opium, or blue pill and Dover's powder are sometimes beneficial; and mild laxatives of castor oil, or rhubarb, are essentially requisite in almost every case: but very small doses, every 2nd day, are in general found sufficient. Embrocations of turpentine liniment, and flannel rollers to the belly occasionally afford relief. Anodyne enemata, and enemata of Ipecacuanha, would I doubt not be useful, but most natives are in general very averse to employ injections. Blisters are advisable when the acute stage is over, but in very debilitated natives they are occasionally liable to induce sloughing. In some cases,

in which a discharge of blood occurred, a solution of sulphate of magnesia has been advantageously exhibited.

Dropsical effusion, either in the form of anasarca, ascites, or merely œdematous swelling of the hands and feet, is attendant on many cases of bowel complaint: when occurring as a symptom at an advanced stage of this disease, it may have arisen in some cases from general debility, but in others was indicative of chronic disease of the liver, and perhaps in some cases of the spleen.

In the cases marked as dropsy, in the tabular return of diseases, there was no great derangement of the functions of the alimentary canal, and the disorder was merely a symptom of chronic inflammatory action of either the abdominal or thoracic viscera. In one case in particular, seen fortunately at the commencement, general bleeding was advantageously resorted to, and the individual eventually recovered. The general treatment of this affection consists in the exhibition of a mixture containing carbonate of ammonia, tincture of digitalis, and nitrous æther; with the use of pills containing squills and blue pill, or small doses of calomel and rhubarb, as might be indicated by the state of the secretions of the alimentary canal: and this treatment, though apparently combining remedies supposed to be op-

posed to each other in their operation, has not been unattended with advantage.

The cases of rheumatism have been comparatively very few, and do not call for any particular remarks. Where the pain has been confined to one or few joints, the application of moxa has afforded relief; and the colchicum, when the medicine was efficient, (for that supplied is often found quite inert,) has been advantageously used when the disorder has been more general.

Ulcers form a prominent item in all the Returns of Sick, but they are not generally severe, or attended with much trouble in their treatment. At the commencement they are usually occasioned by the fretting of the ill-made fetters, or the spreading of an impetigenous affection, to which the Assamese are exceedingly subject, though seldom applying for admission into hospital on this account, and assuredly arising from gross neglect of personal cleanliness. Considerable attention has been paid to the subject of the fetters, and some precautions adopted to lessen this effect; but as far as regards convicts sent from the distant thannahs, it is no easy matter to alter the routine practice. Something more is requisite in Assam, than the mere issuing an order, such as might be sufficient in a civilized country.

Psora is by no means unknown, and does not readily yield even to sulphur. In the cases of chronic impetigo, when the skin appears callous, the ordinary application, a rude mode of applying sulphureous fumigation, is at present under trial. A sort of cloak, made of three good blankets sewn together, and furnished with a tape at top, is placed on the patient, who is stripped and seated on a high morah, underneath which a vessel containing sulphur and some roughly-ground nitrate of potass is placed, and the mixture is set on fire. The tape being properly secured about the throat, no inconvenience is experienced from the sulphureous fumes.

A cutaneous affection very common here, though not peculiar to Assam, may be briefly adverted to: *Daud*—commencing in a slight papular eruption, which dries up, and the scab or scurf peels off; it itches exceedingly during the rainy season, and is frequently troublesome at night. In cases of long standing, the part affected assumes a scurfy appearance, the cuticle constantly peeling off in minute portions. This affection is sometimes confined to circumscribed patches, the upper or lower edge of which exhibits the border slightly raised, and the papulæ here pretty distinct; on this side the disease is progressing, and on the opposite one the eruption is drying up. In other cases, these patches vary extensively; sometimes they unite, and the whole trunk exhibits one general

scurfy character. The upper portions of the body seem most obnoxious to this disorder, although in some cases patches are observed to affect the hips, and inside of the thighs or legs. There appears to be a variety where the papulæ are less distinct, and the scurf not present; but here the skin undergoes a change of colour, and appears mottled, the diseased portions being lighter than the sound skin. This affection is attributed to the water, and is common in the whole eastern portion of Bengal. When attacking Natives from the western provinces, a return to their own country effects a cure. It appears in general to be regarded with indifference, and application is seldom made at the hospital for its relief.

Venereal complaints are common, and usually severe in Assam, though there are few admissions of this disorder into the jail hospital.

The troops stationed at Gowhattee are not unhealthy; nor do I consider, generally speaking, that the jail is so, although unquestionably a very unusual proportion of the sick die, from the various causes I have attempted to describe.

Regarding the Table of admissions inserted in the Appendix, I have to observe, that where two diseases are mentioned, it is to be understood, that

the attacks were not simultaneous, but ought for the purpose of comparison to be considered as two distinct admissions. Many other cases besides those thus specified, were successively affected with ulcers, fever, and bowel complaints; attended in the latter case with dropsy: and the greater number of these are not separated from the others, but are classed respectively under the heads fever, diarrhœa, and dysentery.

GOWHATTEE,
4th January, 1831.

*** At page 41, line 14, from an error in the MS., the population of Gowhattee is stated at 60,000; and the houses 11,200;—instead of which, the numbers should have been 6,000, and 1,120.

Compendium of 47 cases of Bowel Complaint, treated in the Jail Hospital at Gowhattee, in Lower Assam; with an Abstract of the Appearances on Dissection.

Nos.	*Names.*	*No. of days in Hosp.*	*No. of days ill of Dysent.*	*Abstract of Treatment, &c.*	*Abstract of Appearances on examination of the bodies.*
		days.	days.		
1	Amool Chuteah,	75	---	Age 40.	Much serum in the abdomen. Intestines attenuated; pale on their inner surface. Meso-colon vesicular and loaded with watery lymph.
2	Berja Cachary,	69	---	Age 30.	Intestinal canal of natural appearance; inner surface pale.
3	Hebah Cachary,	40	---		Small intestines healthy; interior surface of colon smeared with pus; here and there reddish soft points; no feculent matter.
4	Belmooreah Gooreah,	122	78	Pil. Hyd. cum opio. Occasional doses of rhubarb and castor oil, sago and anodyne draughts, &c.	Emaciated. Alimentary canal attenuated. Mucous surface of colon in several places reddish, but without ulceration. A hydatid attached to the right auricle.
5	Pangooa Cachary,	7	---	Pil. Hyd. cum opio.—Haust. anodyn.—Sago.	Body emaciated; colon containing orange-coloured matter, but its mucous surface unaltered.
6	Dodooa Koch,	29	16	Admitted with anasarca. Age 30. Took squills and calom. and purgatives. Subsequently pil. hyd. cum opio. Copavia mixture for 8 days.	Moderately reduced. Oment. shrunk; small intest. thin. Inner surface of colon having a reddish blush, thickened, and irregular; here and there red points—whole interior of the rectum red, raw, and bloody; surface irregular. On the elevations patches of superficial ulceration. In the colon some thin greyish matter. About 2 lbs. of serum in the abdominal cavity.

7	Nudram Koleetah,	201	37	Aged 35.—Symptoms severe. Calom. cum Opio.—V. S. 16 oz. —Ol. Ricini, &c.	Body not reduced.—Much fat on the omentum. Viscera externally of natural appearance.—On the colon were 5 or 6 dark patches, and beneath the great arch of the stomach an ulcer had penetrated the coats of the intestine; opposite this point the omentum was discoloured, greenish, and soft. The patch was about the size of a rupee, and surrounded with clear yellow fat. Colon internally dark, thickened, irregular; containing dark fœtid coagula: besides the ulcer which had penetrated were several others more superficial. On the rectum there were black patches, and internally dark and sloughy ulcers.
8	Podhaee Doom,	13	...	An old emaciated subject.—Pil. Hyd.—Opium.—Tinct. Opii. —Ol. Ricini.	Oment. shrunk.—In the colon much undigested food. In the rectum a few reddish patches smeared with purulent matter.
9	Nurtum Surmah,	119	38	Aged 20. Dropsical.—Took squills and Calom. Also Pil. Saponis cum Opio.	Much reduced.—Interior of colon irregular and softened, here and there red patches, contents a greyish mixture of purulent mucus. Rectum pretty natural. Much serum in the abdomen.
10	Khetung Cachary,	18	28	Aged 30.—Calom. cum opio. Pil. Hydrarg. Copaiva mixture for 9 days.	Slight emaciation.—Mucous surface of colon dark, with black sloughy patches. Rectum internally quite black, contg. fœtid coagula.
11	Sekoa, Female,	47	...	Pil. Hyd. cum Opio. Chalk mixture with opium.	Mucous membrance of colon softened and smeared with purulent matter, in the rectum some dark patches. Much turbid serum in the abdomen.

Compendium of 47 Cases of Bowel Complaint, treated in the Jail Hospital at Gowhattee, in Lower Assam; with an Abstract of the Appearances on Dissection.

Nos.	*Names.*	*No. of days in Hosp.*	*No. of days ill of Dysent.*	*Abstract of Treatment, &c.*	*Abstract of Appearances on examination of the bodies.*
		days.	days.		
12	Koomrah Koch,---	32	---	Aged 30 years; reduced. Pil. Hyd. cum Opio.—Ol. Ricini.—P. Rhei.	Body much emaciated. Abdomen shrunk; villous surface of colon of an uniform dark red colour, with slight ulceration, and containing only a little bloody mucus.
13	Dultoo,----------	76	28	Aged 24 yrs. Fever.—Pil. Hyd. cum Opio.—Ipecac. cum Ext. Gentian.—Decoct. Cinchonæ.	Emaciated.—Villous coat of colon thickened, and soft, covered with small, distinct ulcerated dots. In the flexure and rectum some greyish liquid fæces—Serum in the abdomen.
14	Jaltee Quoit, -----	28	12	Dropsical. Diarrhœa.—Pil. Scillæ cum Calom.—Decoct. Gent.—Mist. Catechu.	Internal surface of colon thickened, and soft; surface pale; here and there small ulcerated spots. The rectum similar—Contents some yellowish fæcees.
15	Judoo Bureah,----	22	---	Calom. cum opio.—Ol. Ricini.—Pil. Sulph. Zinci. cum Opio.—Mist. Catechu.	Villous surface of colon smeared with purulent mucus, a portion of the rectum dark and altered, in texture, of a cartilaginous consistence—Contents some dark liquid matter. Body much emaciated.
16	Kolai Koleetah,---	130	---	Aged 40 yrs.—Ipecac. cum Ext. Gent.—Ol. Ricini.—Rheum cum Magnesia.—For 6 days pills of Sulph. Zinci.	Much emaciated—Villous surface of colon dusky, Villi very prominent—interior of the rectum dark purplish colour, with a small superficial patch of ulceration; the whole smeared with purulent matter.

17	Pichlu Koa, ------	99	19	Age 35. General ill health and Cough.—Mist. Opii, &c. Pil. Acet. Plumbi.	Mucous membrane of colon healthy; contents yellowish, feculent matter. A few reddish patches in the rectum. Small intestines pale and ulcerated. Thoracic viscera sound.
18	Deeper Doom, ----	54	24	Copaiva mixture.—Opium.—Pills of Sulph. Zinci.—Catechu mixture.	Mucous membrane of colon thickened, of a reddish colour, coats of the intestine softened.
19	Betai Koch, ------	114	30	Fever, subsequently dropsy. Mouth affected with Calomel.—Mist. Opii.—Pil. Acet. Plumbi.	Body much reduced. In the interior of colon here and there reddish patches; a space of four fingers breadth thickened, irregular, and raw, with a few black dots. In the rectum the villous surface red, thickened, and soft, with small pea-like ulcerations.
20	Kolamonai Gounch, --------	131	20	General dropsy. Squills and Calomel.—Mist. Opii.	Several quarts of serum in abdomen. Villous surface of colon healthy. In the rectum a few small ulcerated patches. Spleen white and corrugated.
21	Poar Cachary, ----	42	20	Age 40. Dropsy.—Pil. Scillæ. Decoct. Gentian—Calomel cum Opio.—Pil. Sulph. Zinci.	Body moderately reduced, oment. shrunk. In the colon some yellowish fæces; the interior of the colon dark with a few red patches, also a few ulcerating points covered with pus; interior of rectum having numerous small ulcers on its surface.
22	Kishnoo Ram Ahum, ----------	80		Calomel cum Opio.—Pil. Hyd. cum Opio.—Mist. Opii, &c.	Much emaciated; a reddish blush on the small intestines; interior of the colon red and raw, with some black patches; rectum similar.
23	Munglee Koleetah,	49		Age 35.—Pil. Hyd. cum Opio.—Ol. Ricini.—Mist. Cretæ cum Tinct. Opii.	Much emaciated; small intestines attenuated, colon entirely dark, containing undigested food and some orange-coloured fæces. Villous coat smeared with pus, and here and there dark and red spots—membrane thickened.

Compendium of 47 Cases of Bowel Complaint, treated in the Jail Hospital at Gowhattee, in Lower Assam; with an Abstract of the Appearances on Dissection.

Nos.	Names.	No. of days in Hosp.	No. of days ill of Dysent.	Abstract of Treatment, &c.	Abstract of Appearances on examination of the bodies.
		days.	days.		
24	Calee Ram Koleetah,	54		Age 30.—Pil. Hyd. cum Opio.—Ol. Ricini, &c.	Body reduced. A little fat on the oment. Interior of the colon red and smeared with purulent mucus.
25	Kolimon Cachary,	19		Pil. Hyd. cum Opio, &c.	Emaciated. Reddish patches in the interior of the colon, containing purulent mucus.
26	Todleah Ahum,	94		Pil. Hyd. cum Opio, &c.	Internal surface of colon thickened, dark, and irregular, coated with purulent matter, here and there red points.
27	Kishno Ram,	79		Pil. Ipecac. cum Ext. Gentian.	Small intestines red and covered with flakes of purulent lymph, a deep ulcer in the rectum.
28	Betreh Ram Chooleah,	7		Calomel cum Opio.—Ol. Ricini.—Pil. Hyd. cum Opio.	In the colon small dark coagula; villous surface here and there red. In the rectum larger coagula very fœtid.
29	Nudram Doom,	84	47	Pil. Ipecac. cum Opio.—Ol. Ricini.—Mist. Copaibæ.—Pil. Acet. Plumbi.	Much emaciated. In colon a few reddish spots smeared with matter, but no distinct ulceration; rectum dark with red points, small ulcerations.
30	Hanah Gooreah,	72	36	Calomel cum Opio.—Pil. Ipecac.—Pil. Sulph. Zinci.	Much emaciated. A patch of ulceration on peritoneal surface of small intestines. Villous coat of colon thickened, red, and softened, smeared with pus. A long narrow stripe of ulceration externally on the left side of the

31	Kalee Ram,			Calom. cum Opio.---Ol. Ricini.—Pil. Hyd., &c.	rectum, the gut softened, internally black with patches of ulceration; contents very fœtid and dark, some morbid serum in the abdominal cavity. Not emaciated. A portion of the omentum beneath the right lobe of the liver completely sphacelated: the colon adjacent gangrenous for several inches—the remainder of the gut dark. Turbid serum in the abdomen.
32	Juggroo Quoit,	50	32	Calom. cum Opio.—Ol. Ricini.—Pil. Ipecac. cum Opio.—Pil. Sulph. Zinci.	Much emaciated; colon having here and there patches of red, on its inner surface. Internal surface of rectum more uniformly red, with a few small ulcerations.
33	Nazir Koch,	103	40	Pil. Hyd. cum Opio.—Ol. Ricini.—Pil. Acet. Plumbi cum Opio.	Intestinal canal attenuated, interior of colon exhibiting no increase of vascularity. Contents thin and yellowish. Rectum of natural appearance.
34	Chooapat,	105		Age 30.—Anasarca. &c.---Pil. Scillæ cum Calomel.—Opium.	Extreme emaciation. Colon empty, villous coat here and there reddish. Rectum reddish, and studded with pea-like ulcerations.
35	Beehoo Cachary,	27	10	Age 25. Dropsical.—Pil. Pulv. Fol. Digitalis.—Mist. Opii.—Catechu.—Pil. Acet. Plumbi.	Two quarts of serum in belly; interior of rectum red and thickened with sloughy spots; the whole softened. Pericardium attached to the heart, and lungs to the thoracic parietes.
36	Mayoon Gooreah,	60	40	Calomel cum Opio.—Ol. Ricini.—Mist. Copaibæ.—Mist. Opii.---Pil. Sulph. Zinci cum Opio.	Much emaciation; interior of colon reddish, softened, and thickened; lower portion of the flexure, and rectum having a red irregular surface, with some black sloughy points.

Compendium of 47 Cases of Bowel Complaint, treated in the Jail Hospital at Gowhattee, Lower Assam; with an Abstract of Appearances on Dissection.

Nos.	*Names.*	*No. of days in Hosp.*	*No. of days ill of Dysent.*	*Abstract of Treatment, &c.*	*Abstract of Appearances on examination of the bodies.*
		days.	days.		
37	Poukur Koch, ~~	233	233	Pil. Ipecac. cum Ext. Gentianæ.—Ol. Ricini.—P. Rhei cum Magsia.—Pil. Hyd. cum Opio, &c.	Extreme emaciation. In the colon black lumpy feculent matter—a few slight reddish patches; interior of rectum raw, softened, and bloody—gut empty. Spine diseased, Intervertebral substance absorbed between the 11th and 12th vertebræ. Surface of the bodies of the vertebræ rough, and irregular.
38	Soobharam Koletah, ~~~~~~~~~~	24		Age 25 yrs. Admitted dropsical.	Body anasarcous. Oment. gelatinous. Interior of colon red and soft, with ulcerating spots. Rectum considerably more diseased. contained some thin feculent matter. A quart of serum in the abdomen.
39	Ramput Chooteah, ~~~~~~~~~~	135		Age 40 yrs.—Pil. Hyd. cum Opio.—Ol. Ricini.---Pil. Digitalis.	Much yellowish serum in the belly. Interior of colon red, swollen, and softened; gut empty, excepting some purulent matter. Some liquid fæces in the rectum: its surface smeared with bloody matter, and its living membrane red, soft, and very irregular.
40	Peethoo Koch, ~~	53		Age 20. Consumptive.	Much emaciated. A reddish blush on small intestines, but mucous membrane of natural appearance. Colon containing a little yellowish matter. Villous coat of the rec-

41	Rangamoa Raba,	35		By his own account, when admitted, he had been ill for 5 months.—Castor Oil.—Acet. Plumbi, &c. &c.	tum exhibited reddish, and somewhat elevated points, with minute ulcerated dots. About a pint of serum in the belly. Middle lobe of right lung ulcerated in three points: on pressing the lung frothy purulent matter was pressed out. Neither adhesions nor serous effusion in the thoracic cavity. This state of the parts might have been expected to have given rise to symptoms of Pneumothorax.
42	Colakoa Cachary,	129	40	Age 20. Ulcer and dropsy; subsequently bowel complaint.	Emaciated. Colon internally dark, with small ulcerations, containing a little yellowish matter. Interior of the rectum dark and livid, with extensive ulcerations.
43	Joprah Koleetah,	115		Age 18. Admitted with Diarrhœa.—Pil. Hyd. cum Opio.—Pil. Ipecac. &c.	Much emaciated. Colon contained dark fæces; in the villous coat slight reddish patches; minute ulcerations in the rectum. Adhesion of the pericardium to the heart.
44	Jaee Koleetah,...	65		Age 30. Admitted with fever, subsequently attacked by bowel complaint, and latterly became dropsical.	Much emaciated. Gall bladder containing pale-yellow bile. Stomach internally here and there reddish. Colon internally smeared with purulent mucus, with a few reddish points near the rectum, and in that gut surface raw and red in several places; the villous coat wanting in patches: a little fœtid purulent matter, but no fæces. Much clear yellow serum in the abdomen; liver pale; spleen small and soft. Colon empty and pale. No feculent matter in the rectum, but the gut had a mottled appearance, bluish and red, with irregular elevated points, but no ulceration was perceptible.

Compendium of 47 Cases of Bowel Complaint, treated in the Jail Hospital at Gowhattee, in Lower Assam; with an Abstract of the Appearances on Dissection.

Nos.	*Names.*	*No. of days in Hosp.*	*No. of days ill of Dysent.*	*Abstract of Treatment, &c.*	*Abstract of Appearances on examination of the bodies.*
		days.	days.		
45	Muddooram, Koch,	94		Admitted with ulcers.—Pil. Ipecac. cum Opio.—Pulv. Ipecac. Comp.	Body considerably reduced. Fat on the oment. and a large quantity in the mesentery. The stomach contained a dirty fluid, and some lumbrici. In the colon, on several places were irregular risings, with a rawness on the surface. These surfaces felt hard or rather firm, and they were observed on the sigmoid flexure; but here and in the rectum, the hardness just mentioned was less perceptible.
46	Mahood Ram,	16		Admitted emaciated and exceedingly reduced in strength.	Moderately emaciated. Fat on oment. and mesentery. Stomach pale, and containing much black mucus. Liver enlarged, of a light orange colour. Spleen enlarged. Colon livid, and mottled in several places externally; inner surface smeared with purulent matter, and this being wiped off, disclosed numerous lesions of the villous coat; in some places patches seemed as it were scooped out, without any surrounding redness; at others the surface was red, irregular, and thickened. The gut at the flexure contained

47	Lugna Chundal,	138		Admitted with ulcer; subsequently affected with bowel complaint; much emaciated before death.	fœtid purulent matter, and here the whole surface was in a state of ulceration. A little clear serum in the belly. No fat on the oment. Small intestines of an orange colour, containing thin mucus and dark-yellowish green matter, with here and there purplish streaks on the gut. Contraction between the great and small arch of the stomach, which contained a dirty greyish fluid, and numerous lumbrici. Interior of the great arch reddish; of the small, quite pale. Colon containing feculent matter. Spleen natural. Liver enlarged and gorged with blood. There were adhesions near the mediastinum; and three or four ounces of serum in the pericardium.

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Table of the Diseases admitted into Gowhattee Hospital, during 1830.

JANUARY 1ST, 1831.

	Remaining Jan. 1st.	Admitted during 1830.	Total.	Discharged.	Died.	Remaining 31st Dec.
Cholera,	0	3	3	1	2	0
Diarrhœa,	8	41	49	30	16	3
Dysentery,	7	41	48	15	27	6
Dropsy,	3	18	21	10	11	0
Fevers,	6	163	169	118	36	15
Fever and Diarrhœa,	9	4	13	3	8	2
Ditto and Dysentery,	0	12	12	2	8	2
Ulcer and Diarrhœa,	2	12	14	3	6	5
Ditto and Dysentery,	0	32	32	7	17	8
Ditto and Dropsy,	0	5	5	0	4	1
Ditto and Fever,	0	8	8	5	1	2
Ophthalmia, and Liver Diseased,	0	1	1	0	1	0
Mental Derangement,	0	1	1	0	0	1
Rheumatism,	0	18	18	13	2	3
Rheumatism and Dysentery,	1	2	3	0	1	2
Small-pox,	0	5	5	0	2	3
Abscess,	0	8	8	7	0	1
Contusions and Wounds,	0	6	6	4	1	1
Gangrenous Ulcers,	2	0	2	0	2	0
Impetiginous Affections,	0	9	9	9	0	0
Leprosy,	0	1	1	0	0	1
Ophthalmia,	0	3	3	3	0	0
Ulcers,	7	131	138	105	9	24
Venereal,	0	16	16	13	0	3
Other complaints,	0	10	10	6	1	3
Totals,	45	550	595	353	156	86

Table showing the number of Admissions, Deaths, and Discharges, during each month of 1830, *at Gowhattee.*

JANUARY 1ST, 1831.

	Remaining on 1st of each month.	Admitted during each month.	Total number during each month.	Discharged.	Died.	Remaining, at end of each month.
January,	45	31	76	6	20	50
February,	50	18	68	15	4	49
March,	49	30	79	15	10	54
April,	54	61	115	17	7	91
May,	91	54	145	44	8	93
June,	93	42	135	30	10	95
July,	95	67	162	26	13	123
August,	123	52	175	37	33	105
September,	105	47	152	11	16	125
October,	125	61	186	40	12	134
November,	134	37	171	37	8	126
December,	126	50	176	75	15	86
Totals,		550		353	156	

Total number of individuals apprehended in Lower Assam, during the year 1830, ... 4,622

Average number of Prisoners in Jail throughout the year, ... 580

Average number of Sick in Hospital throughout the year, ... 91,7

Ditto ditto Monthly Admissions, ... 45,8

Ditto ditto ditto Discharges, ... 29,4

Ditto ditto ditto Deaths, ... 13,0

Proportion of Sick to Prisoners, 15,8 per cent.

Ditto Deaths to Sick, 26,3 per cent.

AN

ACCOUNT OF THE VARIETIES

OF

EAST INDIAN OPIUM.

By G. SMYTTAN, M. D.

Presented 7th Jan. 1831.

The varieties of East Indian Opium seem to be little known or recognised in Europe. In the different Pharmaceutical Works, East Indian continues to be described as a very inferior species of opium, and, according to the experiments of Mr A. T. Thomson, good Turkey Opium is said to yield nearly three times the quantity of morphine or narcotic principle, and in purer and larger crystals*.—This may be true of the principal sorts, of opium long known as the product of the Bengal Provinces, but it is certainly not applicable to that variety known to us for the last 13 or 14 years as the product of the Malwa districts, which differs from Bengal Opium, both in appearance and quality, quite as much as Turkey does.

* Vide Thomson's London Dispensatory, 4th Edition, Article "Opium:" also Paris's Pharmacologia, 6th Edition: Brande's Manual of Pharmacy (1825)—and Haden's Formulary for Preparation of the New Remedies, 4th Edition.

The situation I lately held of Opium Inspector at Bombay enables me to furnish, from the records of that office, and my own observation, some information, particularly regarding the composition of the Malwa variety of opium, which may probably be new, and, I trust, worthy the consideration of the Medical and Physical Society.

When Malwa Opium first began to attract notice as an article of commerce, the Supreme Government called for a report upon the qualities of the drug, and for this purpose a set of experiments were instituted at Calcutta in 1821, under the superintendance of the late Mr. Jameison, then Secretary to the Bengal Medical Board. These experiments were repeated, with all the descriptions of opium of which specimens could be procured at Bombay, in 1823, by Dr. I. A. Maxwell, now 2nd Member of the Medical Board, and then Medical Store-keeper and Inspector of Opium. The result of the former (Calcutta experiments) is exhibited in the annexed Table, marked No. 1, and that of the latter (Bombay experiments) in the Table marked No. 2.—In both instances these laborious experiments seem to have been conducted with very great care and attention; the former with the assistance of the establishment of the Calcutta Dispensary, and the latter with that of the Bombay Medical Store Department; although, in judging of the results, some allowance may be made for our want of constant practice in this country as

Analytic Chemists, which can alone give the adroitness of manipulation required in experiments of a nature so delicate and intricate as some of these are.

It would swell my paper beyond the usual limits to give the whole, but a detail of the process in a few of the experiments, from which the Tables are formed, will be given in the sequel, which may be sufficient for forming some opinion as to their general suitableness.

The experiments conducted by myself are in their general results confirmatory of that in these Tables; but I refrain from adding them here, as they are comparatively little varied, and have been executed at different periods, merely to ascertain the quality of opium passing inspection, upon occasions when I was generally too much occupied to admit of my attending to all the nicety of detail.

In Table, No. 1, is included the analyses of two varieties of Bengal Opium, of a very superior kind —those termed *Ryotts* and *Bareilly-bab*, as will be seen from the note appended to the Table. These were obtained from a private source, and, being the produce of a peculiar and careful cultivation, are not of the description of opium found in commerce, or usually to be had in the bazars.—These therefore serve only to shew what the country is capable of; and, in speaking of Bengal Opium, we must

be understood to refer only to that described under the heads of Behar and Benares, now more commonly known as Patna and Benares; the only sorts of opium from Bengal known in commerce; and these, I apprehend, although from differet provinces and different agencies, do not differ more in appearance, mode of cultivation, and general qualities, than the opium from different districts in Malwa, which all enters the market under the general name of Malwa Opium.

In Table, No. 2, the analysis is given of a variety of opium, termed "Cutch," supposed to be the growth of that country*; but as no opium under this name is known in commerce at the present day, our remarks can have no reference to it:—indeed, so far as I can ascertain, no opium is produced in the Cutch territory†, which, as well as Kattywar and Guzerat, would seem to be supplied entirely from Malwa.

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* Vide Note *appended* to Table, No. 2.

† Extract of a letter from Mr. Burnes, Residency Surgeon in Cutch, dated Bhooje, July 3rd, 1831.—"With reference to your inquiries respecting Opium, I have now the honor to inform you, that none of that drug is produced in Cutch, and that all that is imported into it (except some trifling parcels which are smuggled) is sent, on the requisition of the Resident at Bhooje by the Collector of Ahmedabad, who receives it from the Government Agent in Malwa."

The qualities of opium, as a medicine, being considered to depend chiefly upon the quantity of morphine or narcotic principle contained; it will be seen from the annexed Table, that the Malwa and Bengal varieties differ considerably in this respect. Although the result in these Tables, drawn from experiments conducted as much alike as possible in both, are not always uniform, yet the relative proportions in point of productiveness are in most instances sufficiently well preserved for accuracy of conclusion.

According to Table, No. 1, thirteen trials with Bengal Opium (Behar and Benares) give an average of rather more than 2 per cent. of morphine, and 11 trials with Malwa of several seasons give an average of something more than 3 per cent., making the Malwa one-third richer in morphine than the Bengal Opium: while the greatest result obtained in any of the experiments is, from Bengal $3\frac{1}{2}$ per cent. and from Malwa 5 per cent. of morphine. According to Table, No. 2, the result of seven trials with Bengal Opium is an average of 2 per cent., and of the same number of trials with Malwa of 4 per cent. of morphine, thus making the Malwa twice as rich as the Bengal in morphine. The greatest result in any of the experiments, by this Table, being from Bengal $3\frac{3}{4}$ per cent. and from Malwa 6 per cent. of morphine. The best of these results, however, although approaching closely, is still surpassed by that of Turkey Opium, exhibited in

Table, No. 1. The result of five trials here, with Turkey Opium, gave an average of no less than 5 per cent. of morphine; while the greatest result obtained is $6\frac{1}{2}$ per cent.—and this may be considered as pretty near the maximum, for not more than 7 per cent. has at any time been extracted in Europe from the best Turkey Opium; a percentage indeed somewhat above the average results obtained by many skilful Chemists. What then must be the value, in judging by this narcotic alkali, of that Opium termed "Bareilly," in Table, No. 1, and obtained from garden culture, which gives no less than $8\frac{1}{4}$ per cent. of morphine as the result of one experiment, and $7\frac{3}{4}$ per cent. on the average of two experiments.

It has been ascertained however by the most expert Chemists in Europe*, and some of the experiments on which the annexed Tables are founded, tend to confirm the fact, that the process usually employed to separate the morphine does not entirely deprive opium of this alkali, the residue generally containing a certain quantity. Even when the crystals of morphine are deposited, it is often difficult, almost impossible, when they are minute, to collect the whole accurately for weighing; and this difficulty is probably greater with East Indian than Turkey Opium, which is said to yield the morphine in larger crystals†.

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* Vide Haden's Formulary, 4th Edition, p. 21.

† Dr. Maxwell, when engaged with his experiments, unfortunate-

For these reasons I am inclined to think, that the pure extract afforded, may be a better criterion, than the morphine, of the strength of Opium. All our experiments tend fully to confirm the opinion, that the medical virtues and distinguishing properties of the drug reside chiefly in its watery extract, and that in general, according to the productiveness of any given specimen in this, so will be its productiveness in morphine.—On a reference to the Tables, it will be seen, that Malwa Opium stands high for productiveness of extract, both spirituous and watery; and in all the various instances in Table, No. 1, the productiveness of each variety of Opium in morphine is in some proportion to that of its extract, with the single exception of Turkey*. Thus, with Bengal Opium, the average of eight trials, in the two Tables, gives of spirituous extract 59 per cent.

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ly could not procure Turkey Opium; nor have I been able to fall in with any specimen of it sufficiently good, to put this to the test.—Mr. Jamieson makes no allusion to difference of size of the crystals, and from the large size of those sometimes yielded by Malwa, I am inclined to think that the morphine crystals from Turkey cannot differ materially.

* The Chinese, who always prepare that Opium for smoking by forming a watery extract, are well acquainted with the productiveness of each variety of Opium, and rate them as follows:

Patna Opium,	46 to 50	touch—average	48 per cent.
Benares ditto,	46 to 50	ditto—ditto	48 ditto.
Malwa ditto,	70 to 75	ditto—ditto	72½ ditto.
Turkey ditto,	53 to 57	ditto—ditto	55 ditto.

and of* watery $44\frac{1}{2}$ per cent. The average of seven trials of Malwa, in both tables, gives of spirituous extract $69\frac{1}{2}$ per cent. and of* watery 61 per cent. while the average of two trials with Turkey gives 57 per cent., being at the rate of 13 per cent. of* watery extract in favor of Turkey over Bengal Opium, and of 4 per cent. watery extract in favor of Malwa over Turkey Opium. Hence, I am inclined to conclude, that, while in estimation as a medicine, Malwa must be allowed to be more powerful than Bengal Opium, it ought also to be rated higher even than Turkey.

Malwa differs not a little from Bengal Opium in the chemical composition, also of the Residuum after separation of the extracts. But the deductions to be drawn under this head are naturally less definite and satisfactory than the conclusions adverted to above. Experiments of a strictly chemical nature, from the great nicety of the different operations, the subtlety of the facts to be developed, the difficulty of exactly ascertaining the precise action of the re-agents employed, and the various complicated changes silently effected by them, are liable to numerous fallacies.

This is more particularly the case in all investigations into the nature of vegetable matters, where,

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* These include the result in the columns headed "per centage of solubility in water."

from the variety of the ingredients, and their ready convertibility into each other, accuracy of conclusion often eludes the researches of the most practised chemists. All that can therefore be expected in these is, merely an approximation to the truth, which may be sufficiently satisfactory, where the object is of a nature so much less practically important, than that in the preceding part of the inquiry.

In regard to those articles which are common to all the varieties of opium, and form integrant parts of their composition, such as coloring matter, extractive, bitter principle, &c. no particular observations occur. Resin, appears from the result of all the experiments, to exist in smaller proportion in Malwa than in Bengal Opium, but the difference is very unimportant.

Caoutchouc, from all the experiments, would seem to exist in considerable proportion in Bengal Opium; in one of the instances to the extent of 17 per cent.; whereas Mr. Jameison, in all the experiments conducted, at the same time, and in the same manner, (Table, No. 1,) with Malwa Opium, failed to discover any Caoutchouc, and was inclined to ascribe so remarkable a distinction in this variety to some peculiarity in the mode of extracting the milky juice from the poppy capsules in Malwa. He would appear however to have been led to a wrong conclusion, in considering the latter to contain no

Caoutchouc ; for Dr. Maxwell ascertained its existence in Malwa Opium from the result of his experiments in four instances, (Experiments 11th, 12th, 14th, and 27th, Table, No. 2,) in which the substances answered all the tests equally well with that obtained at the same time from Behar. The results nevertheless all tend to shew, that Caoutchouc is a much less abundant principle in Malwa than in Bengal Opium. The other varieties of Opium submitted to analysis, (by Table, No. 1,) all yielded this principle more in proportion to that of the Bengal, and, by the analysis of chemists in Europe, it would seem to be considered an invariable constituent of good opium.

Gluten, by Table, No. 2, seems to enter into the composition of both varieties in nearly equal proportions ; and although by Table, No. 1, it is rather in excess for the Bengal, it is still under the proportion usually found in Europe as a constituent of opium.

Earthy matter has been found largely in both the varieties of opium. By Table, No. 1, the average is, for Malwa 7, and for Behar $4\frac{3}{4}$ per cent. ; and, by Table, No. 2, the average for Malwa is no less than 12, and for Behar 10, per cent. I should have expected the difference on the side of the Malwa to have been even greater than either of these results ; for, from the mode of its formation into cakes, without any

covering, a good deal of dust must naturally adhere. This is in most instances accidental and perhaps unavoidable, although I have too often found pellets of earth pressed into the cakes, and sometimes a tolerably thick coating of it, which could only result from the fraudulent design of increasing the weight. Oil is necessarily found in Malwa, yet not at all in Bengal Opium ; as in the former it is an extraneous addition, and although existing sometimes (as per Table, No. 1,) to the extent of 11 per cent. can scarcely be considered the result of fraudulent adulteration. It is the effect of the mode resorted to by the cultivators in Malwa of preserving the valuable juice in some bland oil at the period of its collection. It might be worth inquiry how far this practice on the part of the cultivators originated in accident, or was adopted from a knowledge of the properties which such oils possess, of not only preserving, but increasing, the narcotic qualities of opium.

Leaves are not found in Malwa, although in large proportion in Bengal Opium, and this not the effect of adulteration, but resulting probably from the mode of its being made up into balls ; the leafy coating indeed forms no less (by Table, No. 1,) than $32\frac{1}{2}$ per cent. of the ball, while the ordinary percentage of leaves in the central part is more than $7\frac{1}{2}$. But, in most of the experiments alluded to in the Tables, in comparison with Malwa, the soft inter-

nal parts only of the Bengal ball or cake have been made use of*.

As to external sensible qualities, Malwa Opium is at once distinguished in the market by being always found in small flat round† cakes, varying from two to three, or about two and a half cakes to the pound‡; whereas Bengal Opium is in large cakes or balls, weighing about 3½lbs. each, internally in a soft, almost fluid, state. Malwa Opium has little or no coating beyond its own crust, to which pieces of straw, poppy leaf, or dust, often adhere; and, after being formed four or five months, the cakes may generally be handled or cut into without adhering to the fingers or knife. When a year old, it becomes brittle in dry weather, and is liable to break

* It must be kept in mind, however, in looking to the weight of the substances noted, as the result of these experiments on the residual, that from the very nature of many of them, it was always difficult and often impossible to bring them to the same degree of dryness for very accurate comparison between them. Some did not readily shew the quantity of moisture contained, while others retained it so tenaciously, (for instance, gluten and Caoutchouc,) as hardly to part with it under any mode of treatment. Hence in many instances, water or other fluid, adventitiously mixed with the real constituent parts of the opium, whilst under experiment, mainly added to their weight, and became an unavoidable source of inaccuracy.

† Sometimes, but very rarely, the cakes are formed globular, and of these a larger proportion proves adulterated.

‡ I found, on the average of ten chests, each weighing about 142 pounds, the number of cakes to be exactly $350\frac{6}{10}$ per chest, the greatest number being 364, and the least 293.

into shining fragments, upon falling or being struck with the knife, attracting moisture again in damp weather; but these are qualities of good opium only. Some of the cakes have an oily dark appearance externally, while others are dry, and almost white, or of the color of bran, or that of the leaf in which they are packed.

Malwa internally is of a light-brown colour, and leaves an interrupted streak of a lighter brown upon paper than Bengal Opium, and is more plastic and less tenacious. It has been said to be very inferior in taste and flavour to Bengal Opium, and to have less fragrancy, but there would seem to be some difference of opinion in regard to this. Dr. Maxwell, in comparing them, by his own senses, could discover no superiority in the Behar ; and, in the London Dispensatory, East Indian (Bengal) Opium is described as having the same odour as Turkey, and to be empyreumatic, with a taste less bitter but more nauseous. The senses however in such a case may deceive in a few instances ; but it must certainly be from some superior quality of this sort, that the Chinese, the principal consumers, give the preference to, and pay so much higher a price for Bengal Opium ; while it is avowedly so much inferior to the other varieties, in what we consider to be the essential qualities of opium*. Malwa

* It is upon the same principle, it is to be presumed, that Europeans esteem wines of different sorts, not merely from their proportions of alcohol.

Opium, however, when good, is by no means devoid of fragrancy, without any empyreuma, and has the usual nauseous bitter taste of Opium.

Adulteration is not unfrequently practised, and for this purpose, a great variety of carbonaceous substances, impure saccharine matter, (Goor or jaggery,) honey, wheat flour, aloes, catechu, turmeric, cow-dung, earthy and various other substances are had recourse to. In fact, in the more palpable instances, any sort of material seems to be employed that is capable of being moulded into the shape, consistence, and color of a proper opium cake; but, with every possible ingenuity, it is seldom that there is not something, even in the external appearance of the adulterated cake, to betray it to the practised eye.

Hitherto Malwa Opium has been but little employed in medicine; nor, so far as I am aware, has any estimate of its qualities, or its effects upon the human body, from actual observation in medical practice, been made. While it continues to be so much in demand, and to fetch so much higher a price in the China market, than Turkey Opium does, it is not likely to find its way to Europe. But it could seem, from the experience of the last few years, that the Malwa territory is capable of furnishing almost an indefinite supply of the drug. It is calculated that not less than 12,000 chests, or 480,000 pounds were last year (1830) exported from it; and, now that the merchants are allowed to make their

own contracts, and to export an unlimited quantity, it is not improbable, that, from excessive manufacture and consequent decline in price, it may all along become an article of export to Europe. And it is well, at any rate, to know, that, in the event of any failure, or interruption to the supply of Turkey Opium, India is capable of furnishing from its Malwa districts an abundant supply of the drug, nothing inferior in quality. It is only to be lamented, that some restraint can not be effectually imposed upon the manufacture of a drug of so demoralizing a tendency, and that so much valuable soil should thus be diverted from the production of the more essential grains, especially in a country like Malwa, which is yet but thinly peopled, and which, in our own day, we have seen scourged by dearth and famine, and its wretched peasantry obliged to flee in swarms.

Detail of the process in some of the experiments from which the annexed Tables have been formed.

EXPERIMENT, No. 1*.

A complete cake of Behar Opium, weighing 23,070 grains; and ten, and about one-fourth cakes of Mal-

* This refers to Experiment, No. 1, in both Tables; at least it is the process followed in each of these experiments, except that in that of Table, No. 1, an attempt was first made to dry the central part of the cake by exposure to the sun, and heat of a gentle sand bath, for some days. The detail here given, however, is that of Experiment 27th, Table, No. 2, more particularly. The same numbers, so far as they go, refer to similar experiments in both the tables.

wa, weighing also 23,070 grains, were divided into small portions, each put into separate large glass receivers, 24 pints of proof spirits poured into each of them, and set to macerate, frequently agitating, for ten days.

11th day.—The menstruum, before being agitated, is of a deep dark-brown colour in the Behar; considerably lighter in the Malwa:—completely transparent, and resembling the Laudanum of the shops in taste, smell, and general appearance,—mass completely broken down 16th day. The solution is set to filter through fine linen. The leaves of the Behar having been carefully separated by the hand, and removed from the receiver, five (5) pints more of proof spirit are poured on the residuum of each, and the whole set to digest for five days more.

21st day. The remainder of the menstruum is poured on the filter, and being repeatedly washed with small portions of proof spirit at a time, allowed to drain through gradually. (The leaves of the Behar having been carefully washed in 10 pints of proof spirit, in portions of two pints at a time, till they ceased to give out colouring matter, had been put aside, and the spirit employed in washing is also put on the filter of the Behar, and allowed to drain through gradually.)

23rd day. The leaves having been carefully washed in cold water, and dried in the sun, weigh-

ed 1,765 grains; were of a dark colour and tasteless, with faint disagreeable smell.

The residue on the filter being washed with repeated portions of spirit, until the menstruum passed through clear, the whole measured, Behar menstruum, 35 pints, 8 ounces; Malwa, 31 pints, 8 ounces. The menstruum of each, being evaporated in a sand bath, to a consistence as much as possible alike, yielded, the Behar 14,336 grains, of a sweet-flavoured, smooth, black, shining, very bitter extract—the Malwa, 18,450 grains, of a sweet flavoured, smooth, shining, very bitter extract, of a lighter brown colour and equally fine flavour.

The residue left on the filter after the proof spirit passed, when freed by careful pressure from fluid, with which it parted with very great difficulty, consists, in the Behar, of 9,540 grains, of a dark-brown, plastic doughy mass, with little if any taste or smell; the Malwa, of 14,218 grains, of a lighter brown mass, or pigment, very like wet clay, with very little taste or smell. A small portion of alcohol added to these becomes very turbid on mixture with water; thus shewing, that the whole of the resin had not been taken up by the proof spirit. The residue is therefore again subjected to three pints of very pure alcohol, and allowed to stand 48 hours.

27th day. The alcohol menstruum is of a deep brandy colour, rather lighter in the Malwa, giving

a copious turbidity with water. It is filtered, and the residue being digested for an hour in another pint of alcohol, this is put on the filter also. The whole of the menstruum, being then evaporated, gives the Behar, 479 grains, of a black resinous matter, smelling of opium, and feeling greasy and unctuous; the Malwa, 346 grains, of a resinous matter, mixed with much oil, lighter in colour than the Behar, also smelling of opium, and feeling very greasy and unctuous, incapable of being dried. These were quite insoluble in water, not even colouring it; freely soluble in acids and alkalies, and burnt with a brilliant flame and dense smoke. The solution in an alkali becomes turbid and milky on being mixed with an acid, as did its solution in an acid when mixed with an alkali, the usual characteristic of resin.

The residue, after the alcohol, was wrung in a cloth until pretty dry, and then formed a dark-brown mass, in the Behar, without taste or smell, weighing 8,040 grains; in the Malwa, a light-brown pigment-like wet clay, also without taste or smell, weighing 11,527 grains. These were subjected to three pints of æther, previously agitated in water, for 24 hours.

28th day. The menstruum of æther, which was of a dirty deep-brown colour, and very turbid in Behar, in the Malwa, lighter brown and less turbid, and occupying much more space in the vessel, with

its sediment; being poured in water and evaporated, gives, in the Behar, 1,092 grains, and in the Malwa, 288 grains, of a light-brown, (in the former dark-brown, shining substance,) in both tasteless and without smell; inflammable, insoluble in water or alcohol; partially acted on by acids and alkalies, and soluble in volatile oils; extremely viscid, tenacious, and elastic, and capable of being drawn out into long threads, which instantly return to the mass on being broken or let go; possessing, in short, all the characteristics of caoutchouc. The substance being treated with kyapooty oil, is wholly soluble in it, the solution deep-brown, and becoming turbid, without complete separation, on being mixed with alcohol. In the Malwa, this substance was unavoidably mixed with oily matter; for as the ætherial solution evaporated, it left on the upper and inside of the vessel a large streak of viscid, tenacious, and elastic substance, proving to be very pure caoutchouc; but the greater part of the product was, on the whole of the æther evaporating, of an oily nature, and of a fine amber colour, settling at the bottom of the vessel, and this could be separated from the streak of caoutchouc with sufficient accuracy to ascertain the quantity of each separately.

29th day. The risiduum, left on the filter, after the æther, is, in the Behar, a black soft adhesive mass, without smell or taste, weighing 6,520 grains—in the Malwa, lighter brown, resembling wet clay,

and weighing 11,065 grains, and both are subjected to three pints of pure potass (liquor potassæ.)

31st day. The potass solution being passed through the filter, and mixed with dilute nitric acid* (in excess), gives a copious dark-brown (in the Malwa light-brown) precipitate.

This, being put in the filter, is repeatedly washed with cold water, to deprive it of the nitrate of potass formed by the union of the acid and alkali, till the water passed off clear and tasteless. The residuum here, when perfectly dried, gives 265 grains, of a black—in the Malwa, 105 grains, of a light-brown tasteless mass, smelling like leather, and becoming adhesive on being moistened with water. On being heated, it shrunk, became soft and elastic, and emitted thick smoke, and a strong smell of burnt horn. It was completely insoluble in water, alcohol, and æther, and soluble in sulphuric acid, forming a deep-brown solution. Nitric acid acted readily on it, and this solution was deep-brown. It was entirely soluble in potass, the solution giving a turbid precipitate with nitric acid. When kept moist, for any time, it fermented, grew soft, and gave out a disagreeable sickly smell. It was evidently vegetable gluten.

38th day. The residue on the filter, after the potass, consisted in the Behar of 1,465 grains, of a

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* It was found, that unless the acid was used in excess the precipitate was immediately re-dissolved.

dark-brown—in the Malwa, 1,803 grains, of a light brown, tasteless, inodorous stuff, friable without tenacity; apparently earthy matter, but not affected by fluoric or other acids.

The following are the results of the experiment.

Original quantity of each sort 23,070 grains.

	Behar.		*Malwa.*	
	Product.	Percentage.	Product.	Percentage.
*Water, ... grains,	2,765	12	1,614	7
Leaves, ... ditto,	1,765	7½	0	0
Spts. Extract, ... ditto,	14,336	62	18,450	78¼
Resin, ... ditto,	479	1¾	0	0
Caoutchouc, ... ditto,	1,092	4¾	0	0
Resin with oil, ... ditto,	0	0	346	1½
Caoutchouc and oil, ... ditto,	0	0	288	1¼
Gluten, ... ditto,	265	1¼	105	½
Earthy matter, ... ditto,	1,465	6¼	1,803	7¾
Loss, ... ditto,	903	4	464	1¾
Grand Total,.....	23,070		23,070	

Experiment 2.

This is merely an extract obtained by digesting the central part of the cakes at the common heat of the atmosphere, in proof spirit, in the proportion of about one pound to the ounce of opium, filtering the solution, and evaporating in a sand bath.

Experiment 3.

This is a watery extract, simply obtained in the same manner, substituting, for the proof spirit, rain

* The percentage of water, in both the Behar and Malwa, is here calculated from the result of experiment 15th, Table, No. 2.

water, in the proportion of about six ounces to the avoirdupois ounce of opium.

Experiment 4.

From the centre of a Behar, and of a Malwa cake of opium, 437½ grains, (the avoirdupois ounce, which was accidentally made use of at first, instead of the troy,) each being taken, about four ounces of water are poured on each, and the mixture set to macerate for five days.

3rd day. The solutions are of a fawn colour. The sediment of the Behar differs from that of the Malwa in being darker, less dense, and occupying nearly twice as much space as the latter, though the glasses are of equal dimensions.

6th day. The solutions are filtered, a little more water (about half an ounce) being added to clear the filter, and each yields a clear dark-brown liquor, that of the Malwa passing through the filter more slowly; and rather in large quantity when passed. Into these solutions 24 grains of perfectly pure Magnesia* were poured, and the mixture boiled for ten minutes. It was then filtered, and

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* The Magnesia was heated to a red heat in a crucible, and its freedom from carbonic acid ascertained by its not effervescing with mineral acids.

the residue* washed with water, till the fluid passed off clear. The sediment* was next treated with small portions of hot and cold alcohol alternately, until the alcohol passed through without discolouration. Lastly, the residue was treated with boiling alcohol for a few minutes into a clear vessel, and the alcohol immediately afterwards filtered. The whole of the alcoholic menstruum was then put aside to cool. No crystals appeared in the Behar in cooling, but that of the Malwa yielded minute crystals.

7th day. No crystals in the Behar, the deposite much increased in the Malwa.

8th day. The Behar solution evaporated on a gentle sand bath $\frac{1}{5}$th of its bulk; small crystals appear on cooling.

14th day. The quantity of crystals yielded in the two specimens is, Behar, $7\frac{1}{4}$ grains—Malwa, $15\frac{1}{4}$ grains.

Experiment 5.

This is the progress suggested by M. Hottot for procuring morphine, and the detail of it corresponds very closely with that of the preceding, except, that

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* The sediment or grayish precipitate left on the filter.

instead of the magnesia, caustic ammonia (liquor ammoniæ, about two drams,) is made use of, to separate the morphine.

The modification noticed in Table, No. 1, is merely the employment of the dried carbonate, 24 grains, instead of the liquor ammoniæ.

Experiment 6.

This experiment was made for the purpose of ascertaining, whether, by using proof spirit, in the first instance, and wholly rejecting water, the morphine might not be procured equally readily as where the latter had been employed as a menstruum—in other respects, the detail of the process is precisely* as in Experiment 4th. The solutions, after being allowed to evaporate spontaneously, till no more crystals of morphine were deposited, were put into a sand bath, and the product was a black, bitter, shining, resinous extract, from each, without taste or smell of opium.

Experiment 7.

This experiment was made with the view of ascertaining the absolute quantity of morphine in each kind of opium. Each was treated with repeated portions of boiling water, till no more colouring matter was procured; then the remaining part

* The quantity of magnesia employed was increased to 34 grains.

of the process, as in Experiment 4, was gone through, with the solutions, to obtain crystals*. About a pint of boiling water, in repeated small portions, was thus used before it passed colourless.

In order to learn, if all the morphine had been carried off by the watery menstruum, the residues in the preceding part of the experiment, after the water, were each digested in 6 oz. of pure alcohol, which was afterwards filtered and heated with magnesia, as the other; then being slowly evaporated and set to cool, equally pure crystals were obtained in small quantity, unluckily not ascertained in the experiments of Table, No. 1; but in those of Table, No. 2, about one-third the amount of those from the watery solution were obtained.

Experiment 8.

In this experiment, instead of crude opium, the watery extract procured, according to Experiment 3, is employed in the proportion of 100 grains, dissolved in 8 oz. of boiling water, and subjected to the whole of Experiment 4, forty (40) grains of magnesia being used.

The quantity of morphine procured in this way is less than might have been looked for, and the results would almost lead us to infer, that the portion

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* Double the quantity (48 grains) of magnesia was employed here.

of the drug soluble in water undergoes some material change during the process of inspissation, or by exposure to the atmosphere, which renders it afterwards incapable of yielding the same quantity of morphine as might have been obtained from the original opium employed for the separation of the extract; but the experiment perhaps is on too small a scale for any accurate conclusions.

Experiment 9.

This and the following experiments were made for the purpose of ascertaining more accurately the constituent parts, or chemical composition, of the varieties of opium, and of determining in what they differ from one another.

A saturated solution of Behar Opium, in boiling water, reddened litmus paper; gave no precipitate with alcohol; with muriate of iron gave a copious curdy precipitate; with oxymuriate of mercury, a brown precipitate; with sulphate of alumina, a copious brown powder; with nitrate of silver, a deep brown powder; with acetate of lead, a copious white curdy precipitate; with sulphates of iron, (green,) and zinc, a curdy precipitate; with red sulphate of iron, a plentiful reddish-brown powder; with tincture of galls, a large yellow precipitate; with pure ammonia, and carbonates of potass and soda, a brown precipitate; with oxalic acid, none; with isinglass, none; with pure barytes and its muriate, a copious brownish precipitate.

A similar solution of Malwa Opium of 1819 reddened litmus paper; gave, with alcocol, isinglass and oxalic acid, no precipitate; with Gowlard's extract, a copious, curdy, dirty, white precipitate; with muriate of barytes, a light brownish precipitate; with muriate of tin, a copious, dirty white curdy substance formed, which floated at the surface; with nitrate of silver, a slight brownish cloudy precipitate; with tincture of galls, a large yellowish white precipitate; with carbonates of soda and potass, a dirty white, copious curdy appearance floating on the surface; with pure ammonia, the same, but precipitate sinks; solution of red sulphate of iron rendering it turbid, and of a reddish brown colour, and green sulphate rendering it turbid, without alteration of colour.

From the action of these tests, it would appear, that the watery solutions of Behar and Malwa are nearly alike in chemical composition. They both contain acid, as is shewn by effects produced on litmus paper, and on the alkalies. The acid is the meconic, combined with morphine, in the state of a super-meconate*. The precipitates caused by the barytic salts would also appear to indicate the existence of a small portion of sulphuric acid. The

* Mr. *Robinet*, from his experiments, considered morphine to exist naturally in opium, combined with a completely distinct acid, which he has termed codeic, thus forming a codiate:—but these experiments of his do not seem to have been confirmed of late years.

presence of gum is proved by the curdy precipitate furnished by acetate of lead, and the reddish brown precipitate with red sulphate of iron; of fecula or gluten, by the precipitate with tincture of galls; of extractive, by the muriate of tin, oxymuriate of mercury, and sulphates of alumina, iron, and zinc; and of the bitter principle by the nitrate of silver and acetate of lead. The solution appears to contain no sulphate of lime or turmeric, as is proved by the inaction of oxalic acid and of animal gluten. The proportions in which these ingredients are held in solution cannot be ascertained, as most of these are reciprocally affected by some of the tests which act on the others, and it hence becomes almost impossible to separate them.

Experiment 10.

The residue of Behar Opium, after maceration in water, in Experiment 4, being weighed, was found to consist of 984 grains of a light-brown and tenacious mass, containing much water, with a fine flavour of opium. Alcohol appeared to exercise no immediate effect upon this, but gave a greyish white cloudy precipitate on the addition of water. Æther dissolved it largely, as did kyapooty oil; the solutions brown, and leaving brown muddy sediments on the filter; acetic acid dissolved it in some quantity, and the solution gave a brown precipitate to pure water of ammonia; sulphuric acid broke down the mass, and rendered it quite black. Potass dissolved it largely; the solution of a brown color,

and giving a flocculent precipitate with sulphuric acid; heated in the fire, the mass gave out an odour of burnt fish, and became very soft, so as to admit of being drawn out into long threads. From these characteristics, it appeared to be principally composed of resin, caoutchouc, and gluten.

The Malwa residue consisted of 540 grains, of a smooth light-brown pigment, having the flavour of opium, but little tenacity, scarcely adhering to the fingers. This was largely dissolved by alcohol; solution left a smooth brown residue on the filter, and gave a deep milky precipitate with water; æther exercised scarcely any effect on it, being only very slightly discoloured, and leaving the residue of the same quantity and appearance as before its use; acetic acid of the ordinary strength did not appear to take any of it up, and gave no precipitate with ammonia or potass; ammonia almost wholly dissolved it, solution deep-brown, and gave a copious white curdy precipitate with sulphuric and acetic acids. When heated, the mass gave out a smell of burnt fish or leather, but did not become viscid, although it shewed oily matter. It appears from this that the mass contained little or no caoutchouc, but more resin and less gluten than the Behar, with some oily matter.

It is needless to pursue the details any further, as the remaining experiments consist almost entirely of some one or other of the processes already detailed

above. It may be worth while however to add a detail of the Chinese mode of preparing the opium for smoking, which is as follows:

Half a cake of one-year old Patna (Behar) Opium, weighing 21 tales, 2 mace, 7 candareens, or 12,536$\frac{4}{10}$ grains troy, being taken, the interior of it is scooped out, and put into a thin hemispherical brass pan; then as much of the coating as has any impregnation of opium is collected into a similar pan. This last is boiled slightly for three successive times in a pint of spring water, and each time strained through a bamboo basket into an earthen pot, some cold water being poured over the dregs or residue after the third boiling. The liquor thus obtained, about five pints, and the process occupying about an hour.

These five pints of thin liquid being poured into the pan containing the interior of the cake, the whole is boiled and stirred together over an active fire, till it attains the consistency of paste, which requires about one hour more. The paste thus produced is divided into two pans, and being well spread out with a wooden spatula, each is inverted, for two or three minutes, alternately, over a gentle fire, till it becomes dry; to facilitate this, the paste is often broken up, respread with the spatula and pressure of the fingers, and crossed with a knife, as the experience of the artist suggests. When quite dry, the whole is put into one pan, spread out with the spatula, and sufficient water being poured over, to cover the opium, (which was here about six

pints,) it is allowed to digest, till the following morning. Next morning this is strained through a piece of cloth or rug, applied in a triangular shape to the edge of the pan, which is tilted up, into a basket lined with coarse paper laid within it, through which it is filtered into another pan; the quantity of liquid thus obtained by filtration is nearly equal to the water poured over the opium or paste the preceding day, viz. six pints. Cold water is then poured over the dregs or residue, filtrating in a similar manner, until tasteless, and nearly colourless; the whole of the weaker liquor thus obtained being also about six pints; the dregs or residue, with a little water poured over, are then thrown into a pot and put aside.

The six pints of strong liquor first obtained are then boiled over a brisk fire, and occasionally sprinkled with cold water from a broom, to prevent boiling over, the scum produced round the edge being removed by means of a feather, and put aside. After boiling about 20 minutes, five pints of the other (weaker) liquid are thrown into the pan, and boiled with it, and the whole, when reduced to about three pints, filtrated through similar coarse paper into another pan. The remaining part of the weaker liquid is then thrown into the pan just emptied, to wash out the adhering particles, and, being boiled for about five minutes, is filtered and added to the three pints. While the whole is boiling down to the requisite consistency, the pan is shifted to a smaller stove or fire-place, and there allowed to remain till a perfect

ring, about the 6th of an inch thick, is formed around the edge, by the steam; when it is at intervals removed from the fire, frequently fanned and stirred with a round stick while off the fire, and the evaporation thus slowly conducted, until completed, in which state it is of the consistence of good treacle, and a fine pure, almost transparent, extract, of an agreeable odour, not unlike that of extract of Gentian. The dregs above mentioned, together with the scum and washings of the pans, are, in the mean time, strained through the rug and basket, the whole thin brownish liquid (from the cold water poured over the dregs, &c.) amounting to about six pints, and this is boiled down in a similar way, forming an inferior quality of extract, which is sometimes used for smoking by the poorer classes, but more frequently reserved for another occasion, to add to the strength of a future manufacture. The process thus conducted occupies altogether about twenty-four hours. The result here was, that the original 21 tales, 2 mace, 7 candareens yielded, of

	T.	M.	C.
Superior extract,.....	9	1	0
Inferior do, (from dregs and washings,)	1	3	1
Consumable opium, ...	10	4	1

or 6,037$\frac{8}{10}$ grains troy, which is fully 49 per cent. The usual economy of the Chinese is apparent in this process; nothing soluble is lost.

This extract undergoes no other preparation or admixture; in the Chinese way of smoking, the bulb

of the pipe containing a small quantity of the prepared opium being merely held to the flame of a lamp, and the vapor is thus drawn in while the person is in a reclining posture, until he has a sufficient dose.

P. S. In the London Medical Gazette of April 17th, 1830, there is a notice of some observations on opium, and its tests, by Dr. Andrew Ure of Glasgow. Considering the powers of opium to depend principally upon the quantity of morphine it contains, and that this must be in an equivalent ratio to that of the meconic acid, with which it exists in the state of meconate, Dr. Ure thinks that, on this principle, a ready mode offers of trying the comparative narcotic powers of different opiums. He proposes to add to solutions of a grain or two of each in a little dilute alcohol, diffused through such a body of water as will make the liquids nearly colourless, and poured into graduated glass measures, a few drops of red muriate (or tincture of muriate) of iron. Red muriate of iron is the best test of the presence of meconic acid, and according to Dr. Ure, a single drop strikes a deep brown red, with a perfectly colourless solution of the acid. The characteristic brown red tint will, according to him, immediately appear, of a depth proportional to the meconic acid, and equivalent to the morphine present; for the previous dilution with water has been so great as to remove the inequalities of colour in the original spirituous solutions. Let the darker shades be now lightened with water, till the tints of the whole be

uniform; and the relative volume of the liquids will afford an approximate measure of the qualities of the several opiums.

Dr. U. states, that, in this ready way, he has tried Turkey, English, and East Indian Opium, and found the results to harmonize sufficiently with their known powers, determined by other methods; and a specimen of an improved East Indian opium (most likely Malwa), supplied by Dr. Chambers, according to this test, approached very closely to the quality of fine Turkey Opium.

I have tried this method of Dr. Ure's, with four different specimens of Malwa Opium, each three times, and with a good specimen of Turkey, of which I fortunately obtained a small quantity, three times also; dissolving for each experiment two grains of opium, and using 16 drops of the Tinct. Ferri Muriatis.

By the average of the 12 experiments with Malwa, and three with Turkey, the quantity of water required to render the spirituous solutions nearly colourless, was, previous to the use of the muriate of iron—with Malwa, 13 oz. 2 dr. 30 minims, with Turkey, 25 oz. 4 drs. After the use of the tinct. ferri muriatis—with Malwa, 13 oz. 5 dr. 30 minims, with Turkey, only 2 oz. 6 dr. 20 minims; and the total bulk of fluid was, with Malwa, 26 ounces, with Turkey, 28 oz. 2 dr. 20 minims. If we are to take the *total* bulk of fluid as

the criterion, the Turkey certainly by this has the advantage ; but I apprehend, to obviate the influence of the more higher colour of the opium, for which the previous dilution is required, we can only take into account the quantity of water added after the use of the tinct. ferri muriatis, and here again the difference is very much on the side of the Malwa. It appeared to me, however, from the result of the trials with the different kinds of Malwa alone, that much depended upon the original colouring matter, and that the test is not to be depended upon ; or, what is as probable, that the experiments were not conducted precisely in Dr. Ure's manner.

It may not be uninteresting here to give some account of the mode of cultivating the poppy and manufacture of opium in Malwa*.

All the varieties of the Papaver somniferum seem to be sown in Malwa, and the white, the red, the purple, and variegated poppy are generally found indiscriminately in one field, a circumstance which may perhaps affect in a slight degree the quality of the drug. The ryots indeed prefer the purple, but this is owing only to the superior thickness and firm-

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* I am indebted for this information principally to an old report by the late Captain Dangerfield, Assistant Opium Agent in Malwa ; but some important particulars have been kindly furnished, up to the present date, by Doctor James Graham, at Mehidpore.

ness of its capsules, which renders less skill and caution necessary in the operation of puncturing.

As in Bengal, the immediate vicinity of the village is selected for this crop, which may be owing as much to the superior richness of the soil, and more abundant supply of water, as the greater convenience, from the constant attention the plant requires in the progress of its growth, and during the collecting of the juice.

The Poppy is usually cultivated as a second crop on ground which has borne one of Indian corn; but sometimes, when manure is scarce, and the soil poor, the first crop is made to supply food for the subsequent poppy. Thus, hemp is sown, and allowed to grow until about to flower, when, in this juicy state, it is turned down by the plough, and rapidly undergoes the putrefactive process, from the influence of the great heat and moisture then prevailing. In the latter part of November, and during December, the ground is prepared by careful ploughing, and beating the soil, and, unless in the last case, by plenty of good manure.—The seed is then sown broad-cast, at the rate of 2 or $2\frac{1}{2}$ seers* per beega†.

For the convenience of irrigation, the field is divided into small compartments or squares, and the whole

* Seer.—A seer is nearly 2 pounds weight.

† Beega.—A beega is about one third of an acre.

is well watered two or three times, before the plant springs, and five or six times during its progress to maturity. After the plants have obtained the height of a few inches, they are carefully thinned at three successive periods, so that the mature plants stand at about three inches distant; while, at the same time, great attention is paid to weeding them, and loosening the soil. The small plants removed at the first thinning are sold, and eaten as a vegetable; those of the second and third possess narcotic and intoxicating qualities, and are seldom used. The only risk, during the first month of its growth, is from the strong frosts, and north-west winds, which often prevail at that season in Malwa, and are very fatal to these crops. The ryots are afraid to sow very early in the season, as such crops run a greater risk. When from this cause a crop is destroyed, which is seldom later than January, it becomes necessary to sow another, which in general proves less productive; and a great deficiency of opium in the market, and rise in price is the consequence. It deserves to be remarked also, that cloudy, damp, rainy weather, occurring during the collection of the juice, is apt to lessen the quantity, as well as deteriorate the quality, of the drug.

In four months the capsules are sufficiently large to undergo puncture, an operation which in Malwa is performed with a small trident-formed iron instrument of three short prongs or blades, about the fourth of an inch separate;—with this three simultaneous

vertical or longitudinal incisions are made in the capsule upwards, in the evening previous to collecting the juice.

The most general mode is to divide the field into four portions, and each day all the ripe plants in one portion are punctured, and in another, the juice collected from those operated on the day before; the collecting the juice occupying the greater part of the day, till it is sufficiently late to commence the operation of puncturing. Thus, in four days, the juice is once collected from the whole field, and those plants which have first undergone the operation, are again ready for its repetition.—A large capsule admits of this four times, the smaller three times. The milky exudation is scooped off the capsules by means of a blunt knife, of about 4 inches in length and $2\frac{3}{4}$ in breadth, the blade of which is kept well oiled. After a certain quantity of juice is collected on the edge, it is removed by the forefinger of the left hand to the back part of the blade, and thus the collector goes on, until he has got a considerable quantity, when he deposits it in a vessel containing a small quantity of linseed oil, which preserves the Opium from change or evaporation. It is afterwards removed from the oil, some portion of which is of course still retained; and, being now put into "ghurras," or earthen pots, it is called by the natives "*cheek*," in which state it is gene-

rally permitted to remain until after the rains (October or November), when it is formed into cakes; although a few petty merchants and cultivators sometimes commence upon this almost immediately.

The labour of forming the juice into cakes is entrusted to a person of some judgment and experience.—A dry, airy room, free from leaks, is prepared by having mats and leaves spread over it; and the juice, being well and thoroughly mixed, it is moulded into flat, round, thick, very rarely globular, cakes; the dried leaves of the poppy (ground) being used to prevent its adhering to the hand: the cakes are then placed on the mats and leaves to dry, with leaves strewed over them, but never exposed to the sun. They are occasionally turned over; and thus, in two or three months become marketable: but they are often allowed to remain much longer, and then bear a higher price. Twenty seers of juice, made into cakes, is calculated to yield, when dried, 16 or $16\frac{1}{2}$ seers of marketable drug. Formerly the cakes for exportation were packed on their edges, with poppy leaf between, in strong baskets, capable of holding about a maund weight, covered with leather, as they still sometimes are; but of late years, they have generally been packed flat, among the poppy leaf or dust, in boxes lined with a bag of coarse cloth or dungaree.

Although there be some independent cultivators, who sell their produce in the markets, yet by far

the greater part of it passes into the hands of a few opulent natives, who minister to the urgent wants of the ryots, and advance them money, stipulating for the whole produce at a certain low rate per dhuree (of 5 seers), or demanding a certain quantity of opium as repayment with interest. These adjustments in general take place in March or April, when the crop has attained such forwardness as to judge of its produce, beyond probable risk of failure. The price, which the cultivator receives for the raw juice, is in general but barely sufficient to repay the expences incurred in cultivation, as it varies from 16 to 25 Rupees per dhuree—a dhuree is about 8 lbs. 12 oz. or five pucka seers. For the payment of the Government dues, he gives the seed, according to an agreed rate; and this in general leaves him a portion, to sell for his own profit, or for extracting the oil, which bears a high price.

The expense of cultivating each beega may be reckoned in general (and this is rather under the mark than otherwise) at about 15 rupees, as follows:

The cost of preparing the land with a plough, harrow, &c. with hire of a pair of bullocks and man,..... Rs.	4	2	0
Manure, ...	1	9	0
Hire of coolies, to divide into squares or beds, &c.	0	8	0
Seed,.....	0	8	0
Hire of four men to water, &c. &c.....	3	0	0
Hire of four men to collect juice,.....	4	2	0
Cart hire, ...	1	2	0
Rs.	14	15	0

In addition to this, there is required for each well, about eight rupees for leather bags, two rupees at least for carpenter* and blackmith, besides the price of instruments, used in collecting the juice.

A beega of ground, well manured, may, in a favorable season, yield from $1\frac{1}{2}$ to 2 dhurees of juice; but, on an average of ordinary seasons, this may be reckoned perhaps at one dhuree, besides about six cutcha maunds of seed, worth about five rupees; and this, especially where advances have been made, gives the poor ryot but little in the way of profit.

* The carpenter, blacksmith and chumar receive yearly, for their work, a certain allowance of grain, calculated according to the number of ploughs or bullocks used in irrigation.

TABLE, No. 1.—*Exhibiting the relative productiveness of several descriptions of Opium, in spirituous and watery extracts, and the varieties in their component parts.*

No. of Experiments.	Sorts of Opium.	Percentage of spirituous extract.	Percentage of watery extract.	Percentage of solubility in water.	Percentage of morphine.	Percentage of water in a cake of Behar Opium.	Percentage of coating to soft parts of cake.	Per centage of leaves.	Percentage of Resin.	Percentage of Caoutchouc.	Percentage of Gluten.	Percentage of Oil.	Percentage of Earthy residue.	Percentage of refuse, saw-dust, leaves, &c.	Remarks.
1st,	Behar of 1820,	50 3/4	"	"	"	"	"	7 3/5	1 3/5	5 1/2	3 3/4	"	1 3/5	"	
2nd,	Behar,	54 3/4	"	"	"	"	"	"	"	"	"	"	"	"	The drying of the Behar was rather overdone, and the specimen was in fact harder and less moist than the Malwa of 1820.
	Malwa of 1820,	67 3/4	"	"	"	"	"	"	"	"	"	"	"	"	
	Dried Behar,	71	"	"	"	"	"	"	"	"	"	"	"	"	
	Ryots,	77 1/4	"	"	"	"	"	"	"	"	"	"	"	"	
	Bareilly,	78	"	"	"	"	"	"	"	"	"	"	"	"	
3rd,	Behar,	"	32 3/4	"	"	"	"	"	"	"	"	"	"	"	
	Benares,	"	25	"	"	"	"	"	"	"	"	"	"	"	
	Malwa of 1820,	"	54 3/4	"	"	"	"	"	"	"	"	"	"	"	
	Malwa of 1819,	"	49 1/2	"	"	"	"	"	"	"	"	"	"	"	
	Malwa of 1818,	"	54 3/4	"	"	"	"	"	"	"	"	"	"	"	
	Ryots,	"	45 1/2	"	"	"	"	"	"	"	"	"	"	"	
	Turkey,	"	44 1/2	"	"	"	"	"	"	"	"	"	"	"	
	Dried Behar,	"	49	"	"	"	"	"	"	"	"	"	"	"	
	Bareilly,	"	57 3/4	"	"	"	"	"	"	"	"	"	"	"	
4th,	Behar,	"	"	"	1 3/4	"	"	"	"	"	"	"	"	"	The properties of the morphine here obtained may be thus shortly noticed. The crystals were
	Benares,	"	"	"	2 1/4	"	"	"	"	"	"	"	"	"	
	Malwa of 1820,	"	"	"	3 1/2	"	"	"	"	"	"	"	"	"	
	Malwa of 1819,	"	"	"	1 1/2	"	"	"	"	"	"	"	"	"	

TABLE No. 1.—*Exhibiting the relative productiveness of several descriptions of Opium, in spirituous and watery extracts, and the varieties in their component parts.*

No. of Experiments.	Sorts of Opium.	Percentage of spirituous extract.	Percentage of watery extract.	Percentage of solubility in water.	Percentage of morphine.	Percentage of water in a cake of Behar Opium.	Percentage of coating to soft parts of cake.	Percentage of leaves.	Percentage of Resin.	Percentage of Caoutchouc.	Percentage of Gluten.	Percentage of Oil.	Percentage of Earthy residue.	Percentage of refuse, saw-dust, leaves, &c.	Remarks.
4th,	Malwa of 1818,	〃	〃	〃	3	〃	〃	〃	〃	〃	〃	〃	〃	〃	very minute, chiefly cubicular, or acicular, transparent, light-coloured, or brown, according as more or less colouring matter was mixed up with them, when deposited from their alcoholic solutions. They were nearly all broken up during collection. They were nearly insoluble in water and æther, but largely so in alcohol, and the solution was bitter—completely dissolved in olive oil. A few grains put on the point of a knife, and held over burning charcoal, fused immediately,
	Ryots,	〃	〃	〃	5 1/4	〃	〃	〃	〃	〃	〃	〃	〃	〃	
	Turkey,	〃	〃	〃	3 3/4	〃	〃	〃	〃	〃	〃	〃	〃	〃	
	Dried Behar,	〃	〃	〃	3	〃	〃	〃	〃	〃	〃	〃	〃	〃	
	Bareilly,	〃	〃	〃	8 1/4	〃	〃	〃	〃	〃	〃	〃	〃	〃	
4th, repeated.	Behar,	〃	〃	〃	2 1/4	〃	〃	〃	〃	〃	〃	〃	〃	〃	
	Benares,	〃	〃	〃	2 1/4	〃	〃	〃	〃	〃	〃	〃	〃	〃	
	Malwa of 1820,	〃	〃	〃	5	〃	〃	〃	〃	〃	〃	〃	〃	〃	
	Ryots,	〃	〃	〃	5 1/4	〃	〃	〃	〃	〃	〃	〃	〃	〃	
	Turkey,	〃	〃	〃	6 2/3	〃	〃	〃	〃	〃	〃	〃	〃	〃	
5th,	Behar,	〃	〃	〃	1 3/4	〃	〃	〃	〃	〃	〃	〃	〃	〃	
	Malwa of 1820,	〃	〃	〃	4 1/2	〃	〃	〃	〃	〃	〃	〃	〃	〃	
	Malwa of 1819,	〃	〃	〃	1 1/4	〃	〃	〃	〃	〃	〃	〃	〃	〃	
	Malwa of 1818,	〃	〃	〃	1 1/2	〃	〃	〃	〃	〃	〃	〃	〃	〃	
5th, modified.	Behar,	〃	〃	〃	1 1/2	〃	〃	〃	〃	〃	〃	〃	〃	〃	
	Malwa of 1820,	〃	〃	〃	3 1/4	〃	〃	〃	〃	〃	〃	〃	〃	〃	
6th,	Behar,	〃	〃	〃	2 1/4	〃	〃	〃	〃	〃	〃	〃	〃	〃	
	Benares,	〃	〃	〃	3 1/4	〃	〃	〃	〃	〃	〃	〃	〃	〃	
	Malwa of 1820,	〃	〃	〃	4	〃	〃	〃	〃	〃	〃	〃	〃	〃	

	Ryots,	~	~	~	$4\frac{3}{4}$	~	~	~	~	~	~	~	~	~	became oily, or rather like melted sulphur, and crystallized again instantly on being cool.—They affected vegetable test papers in the manner of alkalies, and combined readily with acids.
	Turkey,	~	~	~	$5\frac{1}{4}$	~	~	~	~	~	~	~	~	~	
7th,	Behar,	~	~	~	$1\frac{1}{4}$	~	~	~	~	~	~	~	~	~	
	Benares,	~	~	~	$1\frac{1}{2}$	~	~	~	~	~	~	~	~	~	
	Malwa of 1819,	~	~	~	$2\frac{1}{4}$	~	~	~	~	~	~	~	~	~	
	Ryots,	~	~	~	$4\frac{3}{4}$	~	~	~	~	~	~	~	~	~	
	Turkey,	~	~	~	$5\frac{3}{4}$	~	~	~	~	~	~	~	~	~	
	Bareilly,	~	~	~	$7\frac{1}{4}$	~	~	~	~	~	~	~	~	~	
	Behar,	~	~	~	$2\frac{1}{2}$	~	~	~	~	~	~	~	~	~	
	Benares,	~	~	~	$3\frac{1}{2}$	~	~	~	~	~	~	~	~	~	
8th,	Malwa of 1820,	~	~	~	$4\frac{3}{4}$	~	~	~	~	~	~	~	~	~	
	Ryots,	~	~	~	$4\frac{1}{2}$	~	~	~	~	~	~	~	~	~	
	Turkey,	~	~	~	6	~	~	~	~	2	~	~	~	~	
11th,	Behar,	~	~	~	~	~	~	~	~	$8\frac{1}{4}$	~	~	~	$7\frac{1}{2}$	
	Malwa of 1820,	~	~	~	~	~	~	~	~	none	~	$8\frac{1}{4}$	~	~	
	Behar,	$10\frac{1}{2}$	~	~	~	~	~	~	~	6	~	~	~	~	
	Benares,	$22\frac{1}{4}$	~	~	~	~	~	~	~	~	~	~	~	~	
12th,	Malwa, 1820,	$29\frac{1}{4}$	~	~	~	~	~	~	~	~	~	~	~	~	
	Ryots,	23	~	~	~	~	~	~	~	$11\frac{1}{4}$	$4\frac{1}{4}$	~	~	~	
	Turkey,	$13\frac{3}{4}$	~	~	~	~	~	~	~	$4\frac{1}{2}$	~	~	~	~	
	Bareilly,	$15\frac{1}{4}$	~	~	~	~	~	~	~	9	2	~	~	~	
	Behar,	~	~	$57\frac{1}{4}$	~	~	~	~	8	$6\frac{3}{4}$	$5\frac{1}{4}$	~	~	~	
	Benares,	~	~	$40\frac{1}{2}$	~	~	~	~	$5\frac{3}{4}$	14	$5\frac{1}{8}$	~	~	~	
13th,	Malwa of 1820,	~	~	$76\frac{1}{2}$	~	~	~	~	$2\frac{1}{4}$	none	~	$6\frac{3}{4}$	$3\frac{1}{2}$	6	
	Turkey,	~	~	$70\frac{1}{4}$	~	~	~	~	$4\frac{1}{4}$	16	~	~	~	~	
14th,	Behar,	$48\frac{1}{2}$	$11\frac{1}{2}$	~	~	~	~	~	~	5	~	~	$8\frac{3}{4}$	~	
	Malwa,	$56\frac{1}{4}$	$12\frac{3}{4}$	~	~	~	~	~	~	~	~	~	$10\frac{1}{2}$	~	
15th,	Behar,	~	~	~	~	21	~	~	~	~	~	~	~	~	
16th,	Ditto,	~	~	~	~	~	$32\frac{1}{2}$	~	~	~	~	~	~	~	
18th,	Benares,	~	$37\frac{1}{2}$	~	~	~	~	~	$1\frac{3}{4}$	17	13	~	~	~	

Note.—These experiments were conducted in the months of May, June, and July, the hottest season, when the midday heat was often 97°, and that of the night 90°.—The Behar and Benares Opium used was all of the season 1819-20, and possessed the usual qualities of Company's Opium.

The Malwa Opium of different seasons, as above stated, differed apparently very little, except in relative dryness. They were all drier, and more compact than the Behar and Benares—had little bits of straw, slips of wood, and poppy leaves adhering, and soiled the paper that enveloped them, feeling and looking greasy. The Turkey was as dry as the Malwa, of a fawn colour, covered with light-green and reddish leaves, of a strong bitter and acid taste, with narcotic smell and uniform texture.

The Ryots Opium was a specimen grown in the immediate vicinity of Dinapore Cantonment, in 1817, and procured directly from the cultivator. It had been preserved in a glass tumbler—the surface quite hard, but, on removal, the substance beneath quite soft; as much so as the Behar cakes of 1819-20, which it resembled in all respects, but that its flavour was not so fresh and good. The specimen of Bareilly opium was procured from some white poppy plants grown in a gentleman's garden at Bareilly in 1818—the cultivation and irrigation was conducted with peculiar care, and the juice collected in January and February, when the capsules had advanced to their full size. The climate cold, clear, and often frosty. The Opium was firm and compact, not giving way on pressure, admitting of being cut by a sharp instrument, colour deep brown, approaching to black, unctuous and viscid to the feeling, of a bright shining appearance, strong narcotic smell, remarkably high flavour, and intensely bitter but not acid taste—and attracting moisture in damp weather, in common with other kinds of the drug.

TABLE, No. 2.—*Exhibiting the relative productiveness of Behar, Malwa, and supposed Cutch Opium, in spirituous and watery extracts, and the varieties in their component parts.*

No. of Experiments.	Sorts of Opium.	Percentage of spirituous extract.	Percentage of watery extract.	Percentage of solubility in water.	Percentage of morphine.	Percentage of water.	Percentage of coating to soft parts of cakes.	Percentage of leaves.	Percentage of Resin.	Percent. of Resin mixed with oil.	Percentage of Caoutchouc.	Percent. of Caout. mixed with oil.	Percentage of Gluten.	Percentage of Oil.	Percentage of Earthy residue.	Specific gravity.	Remarks.
1st,	Behar,	62 3/4	"	"	"	12	"	7 3/4	1 3/4	"	4 3/4	"	1/4	"	6 1/2	1279	
	Malwa,	76 3/4	"	"	"	7	"	"	1 1/2	"	"	"	1/4	2 1/2	8	1282	
2nd,	Behar,	60	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	Malwa,	74 3/4	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
3rd,	Behar,	"	45 3/4	"	"	"	"	"	"	"	"	"	"	"	"	"	
	Malwa,	"	59	"	"	"	"	"	"	"	"	"	"	"	"	"	
4th,	Behar,	"	"	"	1 3/4	"	"	"	"	"	"	"	"	"	"	"	
	Malwa,	"	"	"	6	"	"	"	"	"	"	"	"	"	"	"	
5th,	Behar,	"	"	"	2 1/4	"	"	"	"	"	"	"	"	"	"	"	
	Malwa,	"	"	"	4	"	"	"	"	"	"	"	"	"	"	"	
6th,	Behar,	"	"	"	3 3/4	"	"	"	"	"	"	"	"	"	"	"	
	Malwa,	"	"	"	5 1/4	"	"	"	"	"	"	"	"	"	"	"	
7th,	Behar,	"	"	"	1 1/2	"	"	"	"	"	"	"	"	"	"	"	
	Malwa,	"	"	"	4	"	"	"	"	"	"	"	"	"	"	"	
8th,	Behar,	"	"	"	3	"	"	"	"	"	"	"	"	"	"	"	
	Malwa,	"	"	"	4	"	"	"	"	"	"	"	"	"	"	"	
11th,	Behar,	"	"	"	"	"	"	"	"	"	11 1/2	"	"	"	"	"	
	Malwa,	"	"	"	"	"	"	"	"	"	6 1/4	"	"	"	"	"	
12th, ...	Behar,	"	"	"	"	"	"	"	"	"	11 1/4	"	"	"	12 1/2	"	

TABLE, No. 2.—*Exhibiting the Relative Productiveness of Behar, Malwa, and supposed Cutch Opium, in spirituous and watery extracts, and the varieties in their component parts.*

No. of Experiments.	Sorts of Opium.	Percentage of spirituous extract.	Percentage of watery extract.	Percentage of solubility in water.	Percentage of morphine.	Percentage of water.	Percentage of coating to softparts of cakes.	Percentage of leaves.	Percentage of Resin.	Percent. of Resin mixed with oil.	Percentage of Caoutchouc.	Percent. of Caout. mixed with oil.	Percentage of Gluten.	Percentage of Oil.	Percentage of Earthy residue.	Specific gravity.	Remarks.
12th, ...	Malwa, ~~~~~	~	~	~	~	~	~	~	~	~	$4\frac{1}{2}$	~	~	~	12	~	
13th,	Behar, ~~~~~	~	~	$66\frac{1}{2}$	~	~	~	~	$1\frac{3}{4}$	~	$14\frac{1}{2}$	~	~	~	8	~	
	Malwa, ~~~~~	~	~	$75\frac{3}{4}$	~	~	~	~	1	~	~	~	~	11	11	~	
14th,	Behar, ~~~~~	61	11	~	~	~	~	~	~	~	9	~	~	~	$11\frac{1}{2}$	~	
	Malwa, ~~~~~	59	$12\frac{1}{2}$	~	~	~	~	~	~	~	$1\frac{3}{4}$	~	~	~	15	~	
15th,	Behar, ~~~~~	~	~	~	~	12	~	~	~	~	~	~	~	~	~	~	
	Malwa, ~~~~~	~	~	~	~	$6\frac{3}{4}$	~	~	~	~	~	~	~	~	~	~	
16th, ...	Behar, ~~~~~	~	~	~	~	~	$28\frac{1}{4}$	~	~	~	~	~	~	~	~	~	The extract here obtained is by the Chinese ; but from the detail of it so carelessly conducted, that the result is not to be depended upon.
18th,	Ditto, ~~~~~	~	$44\frac{1}{2}$	~	~	~	~	~	9	~	12	~	$3\frac{1}{2}$	~	15	~	
	Malwa, ~~~~~	~	42	~	~	~	~	~	$3\frac{3}{4}$	~	~	~	3	$5\frac{3}{4}$	$17\frac{1}{2}$	~	
19th, ...	Cutch, ~~~~~	72	~	~	~	~	~	~	~	~	~	~	~	~	~	1308	
20th, ...	Ditto, ~~~~~	~	$61\frac{3}{4}$	~	~	~	~	~	$1\frac{1}{2}$	~	$25\frac{1}{4}$	~	$2\frac{3}{4}$	~	$5\frac{3}{4}$	~	
21st,	Behar, ~~~~~	$61\frac{3}{4}$	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
	Malwa, ~~~~~	$74\frac{3}{4}$	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
	Cutch, ~~~~~	$76\frac{1}{2}$	~	~	~	~	~	~	~	~	~	~	~	~	~	~	
22nd,	Behar, ~~~~~	~	$40\frac{1}{2}$	~	~	~	~	~	~	~	~	~	~	~	~	~	
	Malwa, ~~~~~	~	$56\frac{3}{4}$	~	~	~	~	~	~	~	~	~	~	~	~	~	
	Cutch, ~~~~~	~	$61\frac{1}{4}$	~	~	~	~	~	~	~	~	~	~	~	~	~	
23rd, ...	Behar, ~~~~~	~	~	~	$1\frac{1}{4}$	~	~	~	~	~	~	~	~	~	~	~	

23rd,	Malwa, ~~~~~	~	~	~	4	~	~	~	~	~	~	~	~	~	~	~	~
	Cutch, ~~~~~	~	~	~	$3\frac{3}{4}$	~	~	~	~	~	~	~	~	~	~	~	~
24th,	Behar, ~~~~~	~	~	~	$1\frac{3}{4}$	~	~	~	~	~	~	~	~	~	~	~	~
	Malwa, ~~~~~	~	~	~	3	~	~	~	~	~	~	~	~	~	~	~	~
	Cutch, ~~~~~	~	~	~	$1\frac{1}{2}$	~	~	~	~	~	~	~	~	~	~	~	~
25th,	Cutch, ~~~~~	~	~	~	~	$8\frac{1}{4}$	~	~	~	~	~	~	~	~	~	~	~
27th,	Behar, ~~~~~	62	~	~	~	12	~	$7\frac{1}{2}$	$1\frac{1}{4}$	~	$4\frac{3}{4}$	~	$1\frac{1}{4}$	~	$6\frac{1}{4}$	~	
	Malwa, ~~~~~	$78\frac{1}{4}$	~	~	~	7	~	~	~	$1\frac{1}{2}$	~	1	$\frac{1}{2}$	~	$7\frac{3}{4}$	~	

Note. These experiments were conducted in the months of September, October, November, December, and January; the thermometer in the room during October ranging as high as 95°, but in the other months from 64° to 84°.

The Behar Opium used was, of the same season as that in Table No. 1, (1819-20,) and, of course, could differ only in being somewhat drier from being 18 months older. The Malwa employed was also of the same season, as one of those operated upon in Table No. 1, (1820.)

The Cutch Opium was a specimen taken from some seized as smuggled, and carried to the Opium Agent's Office, which, from the account given of it, was supposed to be from the Cutch country. It was in round cakes, varying from six to 10 ounces weight, covered with a coating of rice-husks, in which it had been packed, probably while soft. It was of a lighter brown colour than the Malwa—more tenacious and viscid, adhering to the knife, but rather less so than the Behar—of a consistence between the Malwa and Behar—specific gravity greater—had a strong nauseous bitter taste, and fine aromatic flavour, without perceptible empyreuma. Solutions in water and proof spirit resembling those of Behar and Malwa, with equally strong taste and flavour of Opium.

The weights used have been reduced to Troy grains, and the liquid measures those of the London Pharmacopeia, or wine measure. In calculating the results, the decimals as they came nearer the fourth, the half, three-fourths, and the whole, have been taken as such, and fractions not included.

AN ACCOUNT

OF

THE EPIDEMIC CATARRH,

WHICH PREVAILED AT PENANG, IN JULY AND AUGUST 1831.

By T. M. WARD, M. D.

Presented 3rd December, 1831.

The importance of the history of epidemic maladies, generally, will I hope be a sufficient excuse for my obtruding on the notice of the Society, a few remarks on one which has prevailed extensively in this Island, among the shipping in the roads, and on the opposite coast of Province Wellesley, during the past and present months. The disease appeared in the form of severe catarrh, attacking suddenly, in many cases with rigor. The usual symptoms were ardent fever; great languor; sudden prostration of strength; head-ache, often violent; with heaviness over the eyebrows; severe muscular pains over the body, but more especially in the lower extremities: frequently nausea, and sometimes vomiting; harassing and constant cough, at first unattended with ex-

pectoration ; accompanied sometimes with pains in the chest ; sore-throat, producing difficulty of swallowing ; slight inflammation of the eyes ; increased flow of tears ; sneezing and copious discharge of thin acrid mucus from the nostrils. In some few cases, the attendant fever assumed the form of a Quotidian, generally however it was continued ; the skin was hot and dry throughout, or there were repeated flushes and chills, with occasionally a profuse clammy perspiration. The pulse was invariably quick ; its fulness varied much, according to the temperament of the patient. There was considerable thirst ; want of appetite in most of the cases, and the tongue was coated with a white fur. The depression of strength and spirits was considerable during the continuance of the febrile symptoms. The nights were restless, and the cough and catarrhal signs were generally most severe towards the evening, and in the mornings. These symptoms continued, with more or less severity, for two or three, seldom more than four, days, when they gradually disappeared, leaving the patient weak and languid. The cough in most instances remained five or six days longer, at first dry, and harassing towards morning, terminating in free mucous expectoration. In those cases, where the attendant fever was of the intermittent type, it recurred for a few days, after the violence of the symptoms diminished.

The exact number of sufferers from this Epidemic in the Island of Penang, and in Province

Wellesley, could not be ascertained. Few of the inhabitants however escaped an attack of it, more or less severe. It affected at once whole families; it attacked young and old, male and female, of all tribes indiscriminately; several shops were completely deserted during its continuance, and many of the European part of the population were put to considerable inconvenience by the indisposition of their whole establishment of servants. No circumstance occurred during the progress of the malady, to induce the belief of its being contagious: when it attacked a house, the individual members were all affected about the same period. In some the febrile symptoms ran high; in many, the disease shewed itself merely in the form of a slight cold, or common catarrh; the feverish feelings being either so very slight, or of so short a continuance, as not to interfere with the patient's usual occupations. During the continuance of the Epidemic, it was remarked, that horses were very subject to colds; and that several cases of glanders occurred.

The disease was not of a dangerous nature. It was currently reported in the Bazar, that many deaths had occurred from it among old and infirm natives; but I could not ascertain the exact number of casualties. All pulmonary complaints were aggravated during its prevalence. In the Chinese Poor-houses, several old and infirm men were attacked with the disease; and it hastened the death of one in July and three in August. In the Convict-Hospital also,

a patient admitted with fever was attacked with it, and died in July; and two, in which it assumed the form of pulmonary inflammation, died in August.

In the Hospital of the 46th Regiment N. I., 60 cases of the prevailing Epidemic were admitted between the 17th of July and the 12th of August. Independently of these, however, many were attacked with the slighter form of the disease, and did not think it necessary to report themselves sick. The average duration of the disease in those who were treated in Hospital was $5\frac{2}{3}$ days. All were discharged cured.

One patient, who had been for several months labouring under atrophy, from diseased mesenteric glands, was attacked with it, and died. On dissection, the upper portion of both lungs was found completely destroyed by ulceration. A Lascar also, who had allowed the disease to go on for some time, without seeking medical aid, was brought into Hospital in the last stage of pneumonia, and lingered only two days. On opening the body, extensive adhesions of the pleura were found to have taken place; large abscesses existed in the lungs, and the bronchiæ were filled with a greyish muco-purulent matter.

His Majesty's ship Wolf came into harbour, from a cruise, on the 14th of August, and between

that date and the 21st, upwards of 80 men and officers—nearly two-thirds of the crew—were seized with the epidemic in a violent form. All recovered rapidly, except two, in whom the disease was most severe, and they have been since invalided.

The treatment with native patients was simple. An emetic was invariably given on admission. This of itself frequently removed the feverish symptoms. A cathartic was afterwards administered, and if the fever continued, small doses of Tartar Emetic were given, so as to keep up constant nausea. For the first two or three days, the diet was mild ; diluents were freely allowed ; and the pediluvium was used at bed-time. In the cases, in which the fever put on an intermittent form, Sulphate of Quinine was used in the intervals, in conjunction with the remedies above-mentioned. In natives, bleeding was not found necessary, and in fact was contra-indicated by the weakness which occurred throughout the attack. Among the stout, robust, and hardy British seamen of H. M. ship Wolf, however, the disease assumed more of an inflammatory nature. The fever was high, the head-ache excessive ; in some, there was delirium, and there existed in all an evident tendency to congestion in the head and lungs. In them general bleeding was imperatively called for, and was sometimes repeated with success. The debility resulting from the affection disappeared after a few days rest ; with some light decoction of Bark, and a nourishing diet. The cough was relieved by the common

mucilaginous mixtures, containing Squills and the compound Tincture of Camphor. In the milder cases nothing was requisite, but rest, warm clothing, diluent drinks, the warm foot-bath, and a few doses of James's or Antimonial powder.

The disease made its first appearance here about the 15th of July. The month of June had been unprecedentedly dry; scarcely a drop of rain fell from the 3rd to the 25th; the number of rainy days was nine, and the quantity, by the Pluviometer, was found to be 7.05 inches. Between the 1st and 15th of July, there were three rainy days, on which only 1.05 inch fell. During both months, the hot, sultry, unpleasant, and unhealthy S.E. wind had been blowing uninterruptedly. The Thermometer rose generally to 89° and 90° in the middle of the day, and ranged from about 78° to 82° in the mornings and evenings. The 15th, 16th, and 17th of July were rainy, and during those three days 4.25 inches of rain fell, producing sudden coolness of the atmosphere. From the 18th of July to the 11th of August, 2.25 inches of rain fell, on seven separate days; and during the whole of this period, the southerly winds continued to blow. On the 10th of August, the wind changed to the N. and N. W.; heavy falls of rain took place on that and on the two subsequent days, and the disease began to disappear. On the 14th, the wind again became southerly, but occasionally blew from the N. W. during the day. On that night, as already noticed, H. M. Ship Wolf

arrived in harbour, and her crew were attacked with the disease. In two or three days after, the wind continued to blow steadily from the W. or N. W., a small quantity of rain fell every day after the 23rd, and no further attack was noticed in the town or surrounding country.

The above described state of the weather was at first considered as the cause of the epidemic, as it has been invariably observed, that the long continuance of the southerly winds, at all times, produces unpleasant feverish feelings on those exposed to it. The scanty showers, after the long previous drought, it was supposed, had loaded the air with miasmata, the peculiar effect of which, in this instance, was the disease in question. It was ascribed also by many to the sudden coldness of the atmosphere, produced by the rains, after the long continued hot-weather. It was afterwards found, however, that the same disease had previously appeared in Java, in Singapore, and in Malacca; and it was presumed, that the cause was of a much more general nature than was at first suspected.

The following account of the Epidemic as it occurred in Java, written in Dutch, and communicated to the Editor, by a correspondent at Soorabaya, I have translated from the *Javasche Courant* of the 19th of May, 1831.

"*Soorabaya, 8th May*, 1831.

"SIR,

"There has lately prevailed in this island, and its dependencies, a sickness, which, as I have heard, has spread universally here, and has extended to Samarang and Bezorki. As the subject may be interesting to you, I have thought it proper to communicate the observations and inquiries I have made respecting it: more particularly, as the disease first shewed itself in this place. In the latter end of the month of March last, news came from Grissee, that the natives there were so ill, that their daily occupations were with difficulty carried on. Not long after, in the beginning of April, it was discovered in Soorabaya, and attacked indiscriminately every family, European as well as native, both in the city and suburbs; and all the shipping in the harbour were affected with it, except the crew of H. M. Corvette Pollux, which moved out further from shore. In the middle of April, the natives of the interior of the districts of Soorabaya, Bancalhang*, Pamakassan*, and Sumanass*, were seized with the disease, which continued to prevail until the middle of May. No place escaped its attacks; even the people of the mountain of Tinger, situated in the district of Passarooang, were visited by it. Luckily, however, this sickness, as I have understood,

* In the Island of Madura.

is not very dangerous. In this Residency, in the department of Soorabaya, where there is a population of 311,192 souls, 48,217 persons were attacked, and 103 died. In the department of Grissee, with a population of 223,626, there were 52,528 patients, of whom only 8 fell victims to it."

"The observations which I have made on the Barometer, from the commencement of the Epidemic, up to this day, have shewn nothing particular; for it has stood generally between 29.8 and 30.2; whilst the Thermomenter of Fahrenheit, in the beginning of April, stood very high, particularly at mid-day, when it rose to 90°. In the mornings it stood at about 83° or 84°. The weather in the end of March and beginning of April was dry and clear, without wind; but in the evenings the air became very damp. After the rains fell, the heat decreased: and I have seen the Thermometer at Simpang, in the mornings generally, at 79°, and at mid-day, at 84°. The temperature of this place differs a little from that of the town however. The daily falls of rain and the easterly winds produced a pleasant change in the weather, and the sickness afterwards visibly decreased, so that now, I think the cause has ceased here altogether."

"The usual symptoms of the disease, according to my observations, were severe head-ache, sore throat, general heat of body, ague, cough and other catarrhal

affections: these lasted generally five or six days; after which, the patient became convalescent. In some, the cough continued for a few days longer, and also gradually disappeared."

"The natives employed the medicines usually given in coughs and head-aches; as chunam, Gambir, and lime-juice: and they refrained from bathing. It has appeared to me, that very little medicine was required by the generality of patients, whether European or native, and that most were cured by rest, and by taking something which promoted perspiration."

"(Signed) H. J. D."

I have not heard of this Epidemic having prevailed at Batavia, or any station on the northern part of Java. It appeared in Singapore about the middle of June. The following meagre notice of its existence in that settlement is extracted from the Singapore chronicle of the 30th of that month. "We regret to state, that an epidemic sickness prevails throughout the settlement; its attack, though not confined to natives, extends very generally amongst them. It is not however accompanied with any dangerous *symptoms*, being merely a feverish sickness, attended with a cold and cough. Like similar distempers, we trust it will not be long before it makes its disappearance from amongst us, and the

settlement be restored to its wonted general health." From the above account, and from private information, we learn that the symptoms and progress at Singapore were the same as noticed in this Island. There too, the southerly winds had prevailed ; and the disease disappeared on the falling of the rains. Ninety sepoys, out of about 300, were admitted with it into the Military Hospital. No death occurred among them, and the treatment was nearly the same as that adopted here.

The Epidemic reached Malacca about the end of June, and there also spread extensively among the inhabitants, and exhibited the same symptoms. It also disappeared on a change of weather taking place there. As has been already stated, it visited this settlement towards the middle of July.

With the imperfeet data before us, it is impossible to determine at present where the disease originated. It can hardly be doubted, however, that the cause was one of a very general nature; and that the disease as it appeared here, was produced by the same peculiar state of atmosphere, whatever it was, which excited it in the eastern part of Java. It is scarcely possible, that the occurrence of it, in these different places, remote certainly, but following at regular intervals the course of the prevailing wind at the period, could have been a mere coincidence.

The distance from Singapore to Samarang, is by the Map about 600 geographical miles in a S. E. direction, with the large Islands of Billiton, Bangka, and Linten between them. It is probable, though I have had no means of ascertaining the fact, that it may have visited these places in its progress to the northward. We conclude, that the peculiar morbific state of the atmosphere was conveyed by the S. E. wind to the various places attacked by the disease in question: and this opinion will not appear extraordinary, when we remember, that epidemic catarrhs of a similar nature have extended from Europe across the Atlantic to America. The supposed immunity of Batavia is thus easily explained, as from its situation at the West end of Java, it is removed from the direct influence of the S. E. wind. Presuming, that the opinion above expressed is correct, the disease is supposed to have taken two months to reach from Java to Singapore, and $1\frac{1}{2}$ more to extend from the latter place to this island. In all respects, it will be seen to resemble the influenzas which have appeared at various times in Europe;—in its symptoms, more particularly the violence of the fever, the great debility, its short duration, and comparative safety; in its extent, and in its rapid progress over immense tracts of country. Its origin is involved also in the same doubt and difficulty.

I shall be happy, if the communication of the above facts lead travellers, and medical practitioners

stationed in different parts of the East, to notice the actual extent of country over which the Epidemic prevailed, and to observe the nature of the disease as modified by different circumstances of situation and climate.

Prince of Wales' Island,
31st August, 1831.

MODIFICATION

OF THE

ORIENTAL OPERATION OF COUCHING.

By W. W. RALEIGH, Esq.

Presented, 2nd June, 1832.

In the second Volume of the Transactions of the Calcutta Medical and Physical Society, may be found a very accurate account of the method of performing the operation for Cataract, as practised by the native oculists of India; together with a description of the instruments used by them for the purpose, by the late Dr. Breton. This gentleman (as well as many others), although fully aware of the objections to which the native operation is subject, and entirely overlooking its real merits, was induced to advocate it, in the hands of natives, from the supposition, that from their ignorance of the anatomy of the eye, and their manner of proceeding being perfectly mechanical, they were "less likely to do mischief with blunt than with cutting instruments." That such is a very erroneous idea, as it applies to the native operation for couching, and that the very opposite is really the case, must appear evident to every one, who has wit-

nessed the process, and taken the trouble to reflect on what must necessarily be the effect, on the internal structure of the eye, of the several rude manœuvers through which the native oculist passes. Looking over the more trivial objections, such as delay occasioned during the performance of incantations, the application of heat to diminish pain, and such like useless preliminaries. I will call attention to the seriously reprehensible steps of the operation.

It will be remembered, that the instruments employed are a blunt lancet, guarded by thread wound round the blade, and a brass depressing instrument, about four inches long, the extremity of which to be introduced into the eye, forms a solid triangle, having three flat sides, and being about the size of the quill of a common fowl ; a puncture being made by the former, through the tunics, the depressor is introduced, for about an inch, behind the lens, the handle of the instrument is then allowed to hang down, and in this position acts as a lever, the lower edge of the puncture forming the fulcrum, whilst the point of the instrument presses against the delicate retina, at the roof of the eye. After remaining a short time in this situation, whilst some invocation is going through, the attempt is made to carry the instrument over the upper edge of the lens, but, from its bulk, instead of accomplishing this object, it frequently happens that the lens is protruded against the iris, and as the shape of the instrument does not admit of fixing the lens, no command over, or power

of directing its course, is maintained by the operator, the consequence is, that in the act of depressing, the lens continues to be pushed forward against the iris, from the posterior surface of which the uvea is scraped, and rolling beneath the flat surface of the instrument, its upper edge, and indeed sometimes the whole lens, is forced through the pupil into the anterior chamber. In endeavouring to prosecute the operation, under such unfortunate circumstances, I have on more than one occasion, seen the iris torn to pieces, and the chambers filled with blood. The violence, which must evidently be inflicted on the retina, ciliary processes, iris, &c. &c. even where the operation is as neatly performed as the clumsy native instruments admit of, is quite sufficient explanation of the fact, of more acute inflammation following this, than the operation as performed by European Surgeons.

Among the individuals presenting themselves at the Calcutta Eye-Infirmary Admission-Room, I have had numerous opportunities of examining the eyes of those who have been subjected to the native operation for depression: the greater number of these poor wretches have sacrificed the chance of vision to this coarse process; others, having had their sight restored in one eye, apply in hope of getting the other made equally useful; it is in the latter class, particularly, that I have been enabled to form some opinion of the comparative merits of this operation, with that resorted to by European oculists.

Now, objectionable as the native instruments and method of operating appeared to be, I could not fail to remark, that in all successful cases, the pupil was rendered beautifully clear, and distinct vision was generally enjoyed; and that, in some of those instances in which the operation had been performed by a native on one eye, and on the opposite organ by myself or other Surgeon, in the European manner, that the pupil in the first was often more bright than in the latter, and that, whereas in the latter, a repetition of the operation was occasionally required, where the native operation had been resorted to, and dexterously conducted, no subsequent one was necessary. The reason of this is obvious—by the native instrument, the capsule is separated from its attachments, and carried down entire, together with the enclosed lens, whilst in performing the operation in the European way, with Hey's, Scarpas, or other needle, in cases of hard lenticular Cataract, it frequently happens, that instead of carrying down the capsule *entire*, the lens is wrested through it, leaving numerous obtruding shreds, for the removal of which one or more subsequent applications of the instrument are necessary;—but more especially in those cases, where the Cataract is fluid, soft, or only of moderate consistence, the needle ruptures the bag, allows the fluid to escape, or breaks up the substance, without directly removing the opaque body from the axis of vision, and nature is depended on to accomplish the cure by solution—thus, in time effecting what may perhaps be considered (as where extraction is

resorted to) the most perfect result of the operations for Cataract, the complete removal of the diseased substance from the eye. But to the impatient, and particularly to the natives of India, who anticipate immediate benefit, the repetition of operations, and consequent delay, is by no means satisfactory, nor indeed could it under any circumstances be considered advisable, were we in possession of means for accomplishing the object at once with safety.—Some hope of having succeeded to a certain extent in gaining such an important point, has induced me, to introduce to the notice of the Society, an instrument for performing a modification of the native operation for cataract, accompanied by a few remarks which experience in the use of the several instruments, and observation of the benefits resulting from the employment of each, has enabled me to make.

In the construction of the instrument, I have endeavoured, as much as possible, to avoid any increase of bulk, beyond that of the common couching-needle, whilst a main object has been, to make it of such form, as to enable the operator to command, and direct the movements of the lens, during the act of depressing. The blade of the instrument (fixed into a handle similar to that of a couching-needle) is about an inch in length,—for two-thirds of an inch from the handle, the shaft is round, but from the commencement of the extreme third, the blade is gradually dilated into a long oval shape;

the solid centre of which portion being cut out, it forms an oval ring, and as the instrument in approaching the extremity makes a gentle curve, and the inner edges of the ring are sloped away, it may be said to form a shallow spoon-shaped blade,—at this, which is the widest portion, it measures about the tenth of an inch, but as the thickness does not exceed that of a couching-needle, it passes through the eye, in an equally small space.

It must ever be considered indispensible, that the oculist should be competent to perform all the different operations for Cataract, and that he should in each case pursue that course, which holds out the greatest prospect of benefit to the patient; for in diseases of the eye, as well as in every other branch of surgery or medicine, no one method is applicable to every condition. In order, therefore, that it may not be misunderstood, that I consider the modified native operation worthy of superceding, in all cases, the European mode, I will briefly remark, that it is only in cases where from the appearance of the Cataract we may be led to the supposition, that the capsule contains fluid, that the lens is too soft to be depressed by the European needle, or that the capsule is too tough to be carried down entire with the lens, that the method now under consideration may be practised with advantage, over the usual European style of operating. The only form of Cataract, however, to which the modified native operation is inapplicable, is capsular; in this instance, I

conclude, it would be worse than useless to have recourse to it. The manner of performing the operation is as follows:—with a lancet-shaped or Beer's knife, a puncture, the eighth of an inch in length, is made through the coats of the eye, about three lines posterior to the junction of the cornea and sclerotic, and sufficiently low down, to avoid the central artery, any trifling effusion of blood, &c. &c. being wiped away, the depressor is introduced (its flat surfaces directed anteriorly and posteriorly) behind the lens, and carried as high, as its upper edge, when the instrument is turned with its thin edges to face before and behind, and its concave surface downwards, and cautiously insinuated over the margin of the crystalline, which being received within the concavity of the blade of the instrument, is to be gently and gradually depressed; the instrument being at the commencement of this action slightly inclined forwards towards the iris, so as to tilt up the under edge of the lens, which having been carried below the pupil, and so far back, as to insure complete separation from its attachments, the handle of the instrument may be rolled between the finger and thumb, to free it from the lens, and withdrawn.

The principal point of difference between the European and native operation, is, the position chosen for applying the instrument to act on the lens; in the former, the needle passed before the crystalline is applied to the upper and fore part of its body, not on its upper circumference, hence the

frequent rupture of the capsule, and wrenching of the lens through it, in the act of depressing. In the latter, the instrument is made to surmount the capsule and lens, and carries them down together without rupturing the former.

The principle, therefore, on which the native method is founded, is decidedly good, but I have no hesitation in pronouncing the operation, as performed by native oculists, unscientific and barbarous, and I am quite astonished, that it could ever have been considered safe, since I should conceive it scarcely possible, for the most bungling operator, to inflict any injury on the iris, with a couching-needle, at all commensurate to the bruising and lacerating, which the ciliary processes, iris, and retina undergo, during the common native process. As the average success of this operation, given in the second Volume of the Transactions, was evidently estimated by our late friend, Dr. Breton, more from the statement of native oculists than his own observation, I hope it may not appear invidious, in my doubting the correctness of the proportion of failures, being only "ten per cent."—From having several times witnessed the operation, from having seen the native oculist, so much extolled by Dr. B., poke out four eyes in succession, on the same morning; in two of which cases the lens was pushed into the anterior chamber, and in one, the iris torn in half; but more particularly, from constantly having patients brought to me, who have had their eyes destroyed

by this process, or the inflammation consequent on it, I think I have tolerably fair ground for scepticism on this head, and I should be disposed to consider forty or fifty per cent. a more correct average proportion of failures than ten. The statement of the native's having operated seven times, on the same eye, successfully, I altogether discredit;—the rising of the lens could be the only inducement for repeating the operation, and judging from what I have seen, I should conclude, that the native oculist usually succeeds either in depressing the cataract or destroying the organ. The lens does often rise after the operation, generally, I presume, from the cellular texture of the vitreous humor being completely broken up; but also occasionally from the attachments at the lower edge of the capsule not being easily separated by the bulky native instrument; and I may take this opportunity of remarking, that I consider the latter circumstance a frequent cause of the rising of the lens, for I have often found, where the lens has risen after couching, that passing the needle completely beneath, or round it, has occasioned it to fall to, and remain at the bottom of the globe; and since I have followed this practice, which I now invariably observe, I have seldom had the lens rise.

With the instrument subjected for the inspection of the Society, the modified native operation may be performed, with as much delicacy, and as little injury to the internal structure of the eye, as where the European couching needle is made use of; nor

can I see any reason why it should not be equally safe: in a fair proportion of cases, in which I have employed this operation, it has been successful. I cannot yet decide as to whether the subsequent inflammation, generally speaking, is greater than after the European method; in several cases, however, I must say it has been severe, and in my opinion constitutes the principal, and perhaps the only solid objection to the operation performed with the instrument, and in the manner I have advised.

Calcutta, May 23, 1832.

REMARKS ON MALIGNANT ULCER

AND

HOSPITAL GANGRENE*.

By J. L. GEDDES, Esq.

Presented, 3rd March, 1832.

The disease which will form the subject of the following remarks is one of peculiar interest; and though it has met with the attention which its great importance in the catalogue of human ills demands, and has been amply and repeatedly treated of by many eminent practitioners, whose extended experience fully warrants the justice of their opinions and observations, and on whose judgment, the young physician may with perfect confidence rely; yet it will be generally conceded, that every new fact or discovery regarding its causes, progress, and effects,—every change which circumstances render necessary in its treatment, should be candidly stated; and that errors of individual judgment should be

* Throughout the above description, the terms Malignant Ulcer and Hospital Gangrene have been applied synonimously. The latter appearing to be simply, the most severe and ultimate modification of the former.

honestly narrated, with a view to warn others, and to prove to ourselves, that no mode of treatment should be blindly followed up, which conscience and experience do not point out as the best adapted for the attainment of that great object of our professional endeavours, the abatement of human suffering.

With these impressions, I sincerely trust, that the few remarks which personal experience enables me to offer, (and which I do with great deference,) on a disease of the highest importance to all, but more particularly to Military Surgeons, may meet with attention, from their comprising a statement of unadorned facts, and not from any intrinsic merit of their own.

Hospital Gangrene, or the last morbid stage of malignant ulcer, when it does make its appearance in a body of men, and more particularly among such as have been debilitated by previous disease, is to be dreaded and encountered as a most insidious foe. Precautions can rarely guard against its very rapid extension; and no foresight can pronounce the period of its probable cessation, no prognosis can unhesitatingly predict a favourable result, and no mode of cure can be invariably relied upon for its extinction.

The history and symptoms of this formidable disease have been so repeatedly well detailed by

numerous authors, and latterly, more especially, by the talented and intelligent Dr. Hennen; that it would be a task somewhat allied to presumption, to undertake to add any thing to render them striking; and the writer of these pages will content himself with inserting a report of the disease, as it occurred to him, and making a few practical inferences.

During its visitation in a crowded hospital, this malignant ulcer is, I consider, as formidable a disease as Cholera, and like it strikes the beholder with dismay; it runs with such fatal speed through its career, that there is scarcely time for consideration; it must be instantaneously opposed, or else miserable will be the result; and yet often times, with every possible precaution and care on the surgeon's part, it goes on for a time unchecked, and affects indiscriminately healthy and unhealthy subjects. There can, I conceive, be no more melancholy duty entailed upon a medical man, than that of witnessing the ravages of this disease—no patient can be insured against its virulence, and in an affected ward, the slightest accidental scratch may eventually become the most aggravated sore.

A common bubo, the result of sympathetic irritation, often degenerates into this phagedenic ulcer; and I have, in more than one instance, witnessed a dreadful proof of this kind, where the sore occupied the whole extent of the left groin, and where it

had spread over the abdominal muscles, which were laid bare, so as to expose the peritoneum, and from thence down the thigh to the fascia: these were extensive, corroding, and irritable sores, of course baffling all attempts at cure, and soon terminating fatally. Instances have been frequently met with (though not under my own observation) where the inguinal glands and fascia have been corroded, and the large vessels underneath seen pulsating: here there is no chance of affording permanent relief, as though the arteries have the extraordinary power of resisting the ulcerative process, for a long time, and of lying untouched in a mass of gangrenous matter; yet, the powers of the system are seldom able to rally against such constitutional derangement; and death is almost inevitable.

The most striking characteristic of the sore is the rapidity with which it increases; when it begins to assume its malignant form, whatever may have been its original condition or size, it immediately spreads, and almost as it were enlarges under the eye. I have often witnessed what in the morning was comparatively a simple solution of continuity, become before evening an extensive sore: the virulence of such a poison must be great indeed, that occasions a rapid morbid change like this. The cellular texture seems to be the tissue where the poison first exerts its influence, and thence soon extends to other and more important ones, occasioning disorganization and local death in an incredibly short space of time: most of

the ulcers that came under my observation, occurred in the right inferior extremity, and they were generally, and in effect all the worst ones were invariably, confined to the space intermediate between the toes and knee-joints. The sores, when they arose idiopathically, that is without any previous accidental wound or injury, were situated in the most depending part of the limb, and generally got complicated with the ankle-joint, which was usually laid bare: sinuses were often formed, which extended from the ankle to the knee, from which constantly drained off a quantity of greyish, ill-conditioned, highly fœtid matter: such cases were irremediable, except by amputation.

I have seen several instances, where the whole of the tendo achillis was included, and which after a time sloughed off, and yet the patient ultimately got well, and was enabled to walk with but little inconvenience: these facts militate against the generally received opinion, that the rupture, or entire loss by sloughing of this tendon occasions incurable lameness. I have had several men under my care, where the whole tendon in a sloughing state was removed by the scissors; and yet they recovered the use of the limb, with scarcely a perceptible halt*: many similar

* This will possibly appear at first sight a more highly coloured statement than may be deemed consistent with strict accuracy. I conceived such to be unequivocally the case at the time, and was borne out, in the opinion I had formed, by similar instances being mentioned to me as having occurred in the practice of others.

cases have been related to me by medical friends, where the result has been equally auspicious.

The fœtor, arising from a ward infected with these ill-conditioned ulcers, is truly disgusting. Whatever precautions may be taken, by ventilating thoroughly, by sprinkling vinegar, by burning frankincense, aloes, myrrh, &c. and by the disengagement of the nitro-muriatic acid gas, our labour is vain; the poisonous principle is so subtile and so readily suspended in the air, that it is imbibed through the mouth and

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On reflecting lately on this subject, and endeavouring to ascertain whether the plantaris and peronei muscles, from their respective insertions, can in some degree compensate for the loss of the above tendon; and not wishing to rely upon, or be improperly biassed by my own views of the matter, I gladly had recourse to the professional judgment of my friend Dr. Conwell, whose experience in this disease, as well as intimate acquaintance with every description of morbid anatomy, renders his opinion highly valuable; and in answer to my query, whether he had met with similar occurrences in practice, this gentleman advances as his conviction that when the tendo achillis is ruptured, or when it is destroyed, and in either case a healthy healing process goes forward to maturity, the tendon is replaced by a fibro-cartilaginous substance, and the gastrocnemii slowly, but certainly, re-assume their office; and that is precisely the illustration of our own experience. Questionless, the peroneal muscles enable the individual, whilst wanting the use of the gastrocnemii, upon loss of the tendon, to perform several motions with the foot, because they bring the foot towards the thigh, or vice versâ; but ordinarily a substitute for the great tendon is restored, and at the distance of several years, there is generally no halt, which I have observed. I have also twice dissected the fibro-cartilaginous substitute.

nostrils, and adheres, as it were, for a considerable time, to the mucous lining of the mouth and pharynx.

There can be little doubt of the infectious qualities of the exhalations from these sores, as patients at the extremes of infected rooms, or even in different apartments, in the same hospital, become simultaneously affected, without the possibility of having had intercourse with each other, at all events by direct contact. Much danger and distress are however liable to be incurred by the carelessness and inattention of either the patients themselves, or of the subordinate hospital attendants, who, without they are strictly watched and controlled, heedlessly apply dirty sponges or bandages, which necessarily propagate the infection. Dressings, &c. should be immediately burnt, and bandages or cloths never be permitted to be washed and used a second time, for such specious economy is both useless and dangerous; every thing connected with these ulcers should be destroyed without delay.

The dispersion of the nitro-muriatic acid vapours are however highly gratifying both to the patient's feelings and conducive to the comfort of the medical attendants, and should never be dispensed with; moreover, they possibly possess some hidden agency, by which the poisonous miasmata become either altogether neutralised, or at least, so far diluted and weakened, as to diminish considerably the risk

attendant upon their unmodified evolution and extension.

During the progressive stages of Hospital Gangrene, the mental sufferings almost equal the corporeal ones; a sad and gloomy feeling seems constantly to harass the minds of patients affected by it; there appears no hope; there exists a perfect indifference to their situation or fate, except as far as regards present pain; the poor creatures cry aloud for amputation or death*.

I have seen no other disease (except Cholera) where prostration so rapidly supervenes.

The report, which follows, is a sketch of the nature and treatment of cases which came under observation at Prince of Wales' Island, in the early part of 1827, (it was laid before the Medical Board of Madras,) by which the description and management of this gangrenous ulcer will be best seen: it was drawn up before the termination of the complaint described. I

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* Literally true, our first amputations turning out well, and inducing great confidence in this branch of surgery, among the poor sepoys, many of whom earnestly entreated us to have recourse to it, when we were deterred from so doing, by the apprehension of their sinking under the operation.

It is a singular circumstance, and perhaps not altogether unworthy of being noted, that out of about 40 cases of amputated limbs only one was met with where secondary hemorrhage supervened, requiring amputation of the stump above the knee.

had in my hospital about 70 cases, and witnessed upwards of 80 more in that of a medical friend. It is inserted here, from the conviction, that a detail of cases is far more useful and instructive than the attempt at theorizing alone, on any medical subject. In the Regimental Hospital, to which I was attached, we had in all 15 amputations of limbs, besides toes and fingers; and in a Military Hospital, adjoining my own, I assisted a medical friend in about 20 more*. We exactly saved half of our patients.

Soon after the arrival of our Madras force, ordered here to relieve the Bengal troops, the malignant ulcer, which I am about to report upon, made its appearance in the hospital of the 25th Regiment, Madras Native Infantry: it first broke out among the men of the right wing of the corps, who had been resident in this island for about six weeks, and soon extended rapidly and destructively. I relieved Dr. Ward of medical charge about the 20th January, 1827, and at that period, there were no cases of apparent consequence in hospital; the patients were mostly suffering from local complaints, the greater proportion of these being itch, supposed to have originated from previous low diet and want of cleanliness on ship-board.

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* The proportion of recoveries, after amputation, was greater in Dr. Grant's hospital: here our minds were sooner made up as to the absolute necessity of the measure.

This state of things proved however but a deceitful lull: about the middle of February, the malignant sore appeared, and evinced its destructive tendency: every itch-spot, and slight abrasion of skin, from any accidental cause, soon began to ulcerate, and degenerate into a foul phagedenic sore; and I had immediately about 40 patients labouring under the disease, the greater number of whom were suffering in an aggravated degree. The sore in its first stage appeared to be entirely confined to the skin and cellular substance; it spread rapidly through these textures, until apparently checked in its progress by the remedies employed; and when hopes of amendment were most sanguine, suddenly, to the great disappointment of my patient, and my own mortification, its ravages extended much deeper, and muscle, tendon, and blood vessel were rapidly invaded and destroyed; the men's health soon sunk under the influence of the disease. Amputation was had recourse to in some of these latter dreadful cases, not with any sanguine expectation of ultimate success, but with the hope, that nature might have resources, and afford relief, when thus far aided by art: operations in this stage were performed only as the last sad and unpleasant alternative; a measure perhaps justified by the chance of escape, afforded from imminent danger; the patient's full consent to the measure being always previously obtained. So much has been written on the subject of these sores by many who have had from extensive experience such ample means of investigating their nature and cause,

and of conveying every useful and necessary information on these heads, I fear the few remarks, that my limited means and brief experience enable me to offer, must appear very insignificant and uninteresting; but considering it a duty to report things as they are, what I have witnessed, and what I have endeavoured to do, I hope I may be pardoned if the description fall short of what may have been expected. The following brief account of the appearances, modus curandi, and supposed causes of this disease, may perhaps be not altogether unacceptable.

The greater number of the sores, as before observed, originated from such slight causes as an itch-spot, a slight excoriation of the cutis, or from an accidental scratch or bruise. In the space of twelve or fourteen hours, the injured spots increased to the size of a dollar, and gradually enlarged: two or three smaller sores coalesced, and formed one of considerable magnitude; these were usually surrounded by a deeply inflamed purple-coloured base, very painful on being pressed, and feeling soft and puffy on the application of the finger: the ultimate extent of the ulcer usually corresponding with this circumscribed appearance. The ulcerative surface varied in different subjects.

These were the milder forms of the complaint; when it began to spread and assume a more malignant aspect, the ulcers presented every variety of

disorganization. The edges were ragged, elevated, indurated, and the sore penetrated deeply into the substance of the part affected. The inflammation extended far beyond the space originally attacked; œdema of the feet and ankles supervened; large sloughs were formed, and hœmorrhage from the neighbouring vessels took place in a greater or less degree; the discharge was excessive, and the fetor intolerable. The extent of the sores was in several instances very great: there were two or three cases, where, from the tuberosity of the tibia down to the ankles, and over the instep, the whole limb was denuded; and we saw many more which were closely allied in point of size. One case went rapidly through its career to a fatal termination, gangrene almost immediately taking place, and carrying off the patient: several small abscesses, that were opened by the lancet, were converted into this formidable ulcer; one in particular, which was a common boil, on the inner part of right arm, spread so rapidily as to make me dread exposure and ulceration of the humeral artery; this accident however did not happen, but after a tedious trial of many different remedies, healthy granulations formed, and there is every probability that the arm will be saved. During the progress of these cases, the men's sufferings were intense, and the constitutional irritation necessarily great; stout healthy men were worn down to mere skeletons. I should have before observed, that most of the sores attacked the middle or under part of the legs. Up to this date (30th April), it has been necessary to have

recourse to amputation in six cases; five limbs, and a finger. There are two or three more men in hospital, who will I fear ultimately require this measure. Three of the subjects of operation, I regret much to say, have died: one the third day after the loss of the limb, and another in the third week: the previous sufferings and debilitated state of these two rendered the prospect of success exceedingly dubious; the last case promised to do well, every thing appearing to go on prosperously for a month, when the patient was carried off by successive attacks of fever; the other three have every chance of being restored to permanent health.

The remedies employed to check the progress of the phagedæna, and to restore a healthy action in the morbid parts, were what are usually recommended in such cases, varied of course, according to circumstances. In the milder form, when the ulcerative process had as yet committed comparatively slight devastation, and when the powers of the system were still vigorous, gentle stimulants were tried (such as the Unguent. Hydrarg. Oxyd. Rub.—Unguent. Nitr. Hydrarg.—Dressings with resinous ointment, the application of the adhesive strap, weak solutions of Sulph. Cupri and Nitr. Argenti, aided by bandaging, and persevered in until a cure took place. In the more aggravated and painful cases, however, where the system soon appeared to sink under continued and harassing influence of the disease; where the evening paroxysms of fever, the sleepless nights, the white

tongue, dry skin and quick small pulse, the disordered bowels, the increased thirst and total loss of appetite, marked the high degree of constitutional sympathy with the local derangement; a more decided plan was adopted: a large dose of calomel, antimony, and opium was administered night and morning, and repeated as existing symptoms argued its necessity; purgatives of various kinds were in use, whenever the torpid bowels required their employments: beer and wine were given freely to support the strength under the copious discharge and sloughing that took place; bark and the sulphate of quinine, as a more grateful substitute, were administered with the same wine; a more generous diet than what the sepoys had been accustomed to, was allowed. The external remedies were large fermenting poultices applied so as to incase the whole limb; dressings of turpentine and rosin, charcoal and bark in powder; powdered alum sprinkled over the surface:—in a few instances, the nitric acid was applied undiluted; ground pepper was recommended and tried. The sores were exposed to the steams arising from decoctions of clove-leaves, and those of the nutmeg, a very grateful application for the time. The citric acid was likewise used. I must however acknowledge, that very little benefit resulted from any of the above medicines. Nothing would seem to have any power over the more extensive ulcers: in a few I employed scarifications, as recommended in a late work by Dr. Hutchinson, round the inflamed base; but these, I regret to say, were attended with more harm than good.

Several of the sick were allowed to go to their quarters, in hopes that a change, however slight, might prove useful; this experiment likewise failed. Sixteen men, whose sores were getting daily worse, were subsequently sent down to Malacca. At that station none of these ulcers have appeared in the detachment of my Regiment, which froms the garrison; and this was the motive which principally induced the recommendation of the above men being sent thither, in hopes that the change of climate and reported healthiness of that settlement might prove the means of accelerating their recovery.

I believe it will be somewhat difficult to point out any ostensible cause for the appearance of the above ulcers in this Regiment. It would require for its development many explanations and many investigations, which I fear my limited means for inquiry and judging will prevent me affording. I have been too short a time on the Island to form an opinion, as to its healthiness, or the reverse. The following are the conjectures which may be admitted on the subject: change of climate, and want of animal food may be both sufficient and powerful causes for rendering the system obnoxious to this description of disease: the former by some hidden agency occasioning a predisposition to the attack; and the latter, by the debility: a privation of due nutriment affording every facility for this predisposition being called into action. The rations that the men are allow-

ed on foreign service are, I have been given to understand, excellent in quality, and in quantity more than they have been accustomed to: but being merely vegetable, this allowance will not altogether compensate for the deprivation of that food which every sepoy, on the continent of India, has within his reach, at a moderate price; here mutton is seldom seen even at the tables of the opulent. The religious prejudices of the plurality of the native soldiery prohibit their eating pork, which is abundant and good. Poultry is likewise too expensive for their humble means, and fish is the only substitute left. This latter article of diet is abundant, but from the distance it is carried before offered for sale, is often soft and unfit for use; in this state, however, it is purchased and eaten by the natives. Dr. Conwell, the Staff Surgeon of our Madras troops, suggested this as a possible cause of the appearance of the Hospital Gangrene; and his opinion gains great weight, when the circumstance of the men not suffering from it on their first arrival, but after they had been six weeks or two months residents, and had partaken largely of such food, is taken into consideration. Dr. Conwell superintended the treatment of most of my worst cases, and afforded in the kindest manner his advice.

The above attempts at explaining the cause of these ulcers will, I apprehend, appear lame and inconclusive. But such as they are, I beg leave

to submit them. I ought before to have mentioned, that soon after the 65th Regiment Bengal Native Infantry had arrived at Penang, the same species of ulcer made its appearance, but with much more fatal consequences. I have understood, that upwards of 120 men were by death, amputations, &c. lost to the service during its prevalence."

From the foregoing report, it will appear, that no established mode of practice was generally successful: in some of the most confirmed cases, even the slightest and most bland application was painful; after a certain period, nature seems to have lost all her wonted energy: her powers were paralysed, and the subject sank a ghastly martyr to a loathsome disease; no stimulus, either internal or external, could serve to rouse the decaying strength of the system, and many a poor sufferer rejoiced at the prospect of death, as the only sure means of being relieved from present misery. In many of the latter cases, which though severe, appeared less rapid in their progress; after every expedient suggested by existing circumstances, or warranted by experience, had been tried unsuccessfully—a healing process took place, if cleanliness alone were strictly adhered to, and some mild topical application used twice or thrice every day; the sores in several instances gradually divested themselves of their malignant character, assumed a kindlier action, and the patient after a protracted convalescence recover-

ed. The question of amputation is one of primary and vital importance, and indeed it would be a happy circumstance if we could rely upon it as a safe alternative, when other and milder measures fail us; but I fear that in most cases this "ultimum remedium" is delayed too long, and that under the humane, but mistaken expectation of saving a limb, much more injury is done than would *cæteris paribus* have followed the earlier adoption of such a sacrifice. The sore runs so rapidly, through its respective stages, progressively deteriorating, and mortification so very hurriedly supervenes, that doubts and hesitation are liable to hazard life.

Waiting for the "line of demarkation" is only sealing our patient's death-warrant, and decision in a case, as it indubitably is of life or death, must be prompt and final.

If a sore have resisted for 3 or 4 days all the usual means of cure, if the subjacent tissues are becoming deeply affected, if hemorrhages supervene, if the constitution be participating to a high degree, with the local affection; our only hope of safety is in the knife, and in many instances we will be gratified by the patient's speedy recovery. To obviate the danger of the stump becoming contaminated with the prevailing affection, we must be careful, if possible, to remove our patient to a purer atmosphere, to inculcate the absolute necessity of cleanliness, and to use every

precaution that no communication take place between the convalescent and affected.

Having spoken so freely respecting the propriety of early amputation in this disease, I with regret acknowledge, that had I at first acted on the principles here laid down, several of my patients would in all human probability have lived; but inexperienced in the disease, and deceived by the occasional gleam of improvement the sores exhibited, I was induced to delay. However, observation soon taught a different mode of conduct and practice. With regard to remedies, calomel, combined with antimony and opium, was useful, I think, in occasioning cutaneous transpiration, and alleviating pain, as well as unloading the primæ viæ without excessive purging, which would have been highly detrimental. Beer, wine, and brandy were liberally supplied by the local Government, and were in constant use, but were not of essential advantage. Of all the external applications (and these were not a few) tried on the same, or on different individuals, a decoction of cloves or nutmeg-leaves, which were gathered fresh as required, was most soothing to the patients' feelings: these, as they were the produce of the island, and easily obtained, were unsparingly used.

The diluted nitric acid in many, and the concentrated acid in two instances, was used with temporary benefit only. I consider, that the method of

scarifying the edges of the sore, as recommended by Mr. Hutchinson and other late writers, is not adapted (as has been already observed) to this description of ulcers, or, at all events, the practice should be had recourse to at a very early period of the disease, otherwise it would seem to increase the extent and spreading of the gangrene.

In conclusion, I would have wished to have offered some remarks on the autopsy of such patients as sunk under this disease; however, the prejudices of the natives are so strong, that I have had few or no opportunities of ascertaining the morbid appearances on dissection.

P. S. These remarks were made, before a lengthened residence on the island, had enabled me from experience to offer any thing more satisfactory. It is probable, that the circumstances above stated, were not the only, nor even the chief existing causes. A malaria, generated by the decomposition of vegetable matter, over whole tracts, where jungle, the property of private individuals, had been cut down about this time, and allowed to remain unburnt, must inevitably have had a very deleterious effect on the health of the sepoys.

About the same time, a fatal bilious remittent fever appeared: debility, and almost immediate collapse, were the distinguishing features of this fever, and

these symptons were in a somewhat minor degree the attendants of the ulcer in question.

It may perhaps be as well to mention, that the hospitals in which the ulcer prevailed were situated in a low, damp, almost swampy, plain, where there were no artificial drains. During the prevalence of the heavy rain, the moist and chilly exhalations arising on all sides must have been of great detriment.

I fear Pulo Penang must yield to some more genial clime, the character it has long been usual to give it of being an Indian Paradise: at all events, the deaths of many an excellent servant of Government, both Civil and Military, from diseases incidental to the island, and the long list of casualties in our Coast Regiments, will fully attest the doctrine of its occasional unhealthiness. From an eighteen months' experience of the salubrious climate of Malacca, I should unhesitatingly give it the preference over Penang, and would recommend the invalid, from Bengal or Madras, especially if suffering from hepatic or phthisical affections, not to remain long at the former, but to select as a permanent place of abode either Malacca or Singapore. This last mentioned Residency is one of the most beautiful, and in every respect interesting, settlements in the East; and embodies every advantage, both natural and artificial, that could possibly be looked for, including one of paramount consequence to those

whose health may ultimately require such a change, viz. of being enabled to procure at least twice a month the opportunity of getting home by ships either directly from the port itself; or, by those belonging to the Honorable Company, engaged in the Chinese trade.

Madras, 10*th December*, 1831.

AN

ACCOUNT OF SOME EXPERIMENTS

RELATIVE TO

VACCINATION.

By G. G. MACPHERSON, Esq.

Presented, 3rd December, 1832.

Circular from the Medical Board to Superintendents of Vaccination.

Sir,

The numerous instances of varioloid disease of a dangerous and even fatal character, which have of late occurred in persons, who were previously supposed to be protected, if not against attack, at least against a fatal issue, have so shaken public confidence in the powers of vaccination, that it becomes the duty of the guardians of the public health to endeavour, by every means in their power, to prevent the neglect of this invaluable prophylactic, which might otherwise result.

It appears to the Medical Board, that the principal means, by which it may be hoped to effect this desirable object, will be to improve, if possible, the prophylactic powers of the antidote, and thus render

it more worthy of public estimation. With this object in view, the Board request, that you will institute a series of investigations and experiments, for the purpose of regenerating the virus, and restoring it to its pristine activity, if so be that it has degenerated.

The best means of effecting this, the Board apprehend, will be, to obtain a fresh supply of virus from the original source ; in doing this, however, they beg to warn you not to be too communicative with the natives on the subject, for the Board believe it to be an undoubted fact, though not generally known, that the origin of the vaccine disease, instead of advancing the general spread of vaccination among them, as some have imagined, has tended powerfully to retard it, especially among the Hindoo inhabitants.

At the expiration of a reasonable period, the Board will expect to hear of the result, which has attended your labours.

Reply from G. G. Macpherson, Esq. Superintendent of Vaccination at Moorshedabad.

Conformably with the instructions I had the honor to receive from the Medical Board, contained in your letter of the 4th June last, I lost no time in instituting a series of experiments, with the view of regenerating the vaccine virus. I now beg to submit a few remarks, and the result of my investigations, for the Board's consideration and farther orders.

2. No case has ever come to my immediate notice of variola after vaccination, amongst the Europeans or natives at this station; but the Rev. Mr. Hill informs me, that eight years since, a child of his, who was then about three weeks old, was vaccinated by Dr. R. Brown, in Calcutta, who, not at all satisfied with the pustule produced, directed that another trial should be had recourse to at this place; which was accordingly done, and the effect was considered satisfactory.

3. Another child of the same gentleman was vaccinated four times, without effect, and on the fifth attempt a pustule was produced. The same was the result with a little girl, who, after several fruitless attempts, at last was supposed to have taken the disease.

4. Six months after the last vaccination, viz. in February, 1829, one of Mr. Hill's servants complained of illness; but, as he continued to perform his duty at times, no particular attention was paid to his symptoms, till the sixth day, when variolæ made their appearance over the body, and, shortly afterward, the three children, above-mentioned, were successively attacked, but in a mild and distinct form, all making rapid and complete recoveries.

5. The servant, from whom the children were supposed to have taken the infection, died, and two, out of five other servants, who were attacked subsequent-

ly to the children, fell victims to the disease. Here we have a striking instance of the benefit of vaccination, even admitting that its prophylactic powers are insufficient to yield complete immunity from small-pox,—that disease, if it does supervene, becoming so mild and modified, as to be deprived of its usual destructive virulence; but where there is so marked a difficulty to introduce cow-pox, as in the cases of Mr. Hill's children, it becomes the more necessary, that the medical man should satisfy himself as to the true nature of the pustules at last produced.

6. I have seen many instances, both in Europeans and natives, where after vaccination, the usual inflammation and slight fever have supervened, and a pustule has formed, which would be considered quite sufficient by many, but which the attentive observer immediately discovers to be spurious.

1st. From there being no well defined pink areola, in the European subject, or a dark hard halo round the crust, in the native subject.

2nd. From the changes of the pustule commencing at its edges, instead of the centre.

3rd. From thick matter escaping after a puncture, instead of transparent ichor. And lastly,

4th. From the crust being of a light colour, loose texture, and irregular form, instead of the firm, hard dark-brown scab, so peculiar to true vaccine.

7. Whether the frequent instances, that have of late years been reported, of small-pox succeeding vaccination, owe their origin to the slight attention usually paid to the appearance of the pustule produced, or to the degenerate state of the lymph made use of, or to some inexplicable peculiarity of system, which resists the introduction of cow-pox, thereby leaving the patient susceptible of variolous contagion, are questions, on which there will be many different opinions. But, were medical men invariably to convince themselves, by particular attention and by Bryce's test, that the constitution has been affected, and the true characteristics of the disease produced, there can scarcely be a doubt, that instances, tending to bring this grand preservative against a dreadful disease into disrepute, would most materially diminish; for, were failures entirely owing, as some suppose, to deterioration in the quality of the lymph, (from having been transmitted through so many thousands,) those who have of late years been vaccinated, would be much more liable than their predecessors to small-pox. But daily experience proves this to be by no means the case.

8. Small-pox raged with the most destructive virulence in this city and vicinity, during the months of May, June, July, and August last; and soon after receiving the Board's instructions, I made many attempts to introduce the disease in cows, by exposing them to variolous contagion, covering them with the blankets of patients labouring under the disease,

and by inoculation; but all to no purpose; although in these instances the animals had very marked feverish symptoms, and, in one, those symptoms were followed by a few small ulcers on the abdomen, from which, two cows were inoculated on the udder and teats, but no local or constitutional effects followed the operation or experiment.

9. Finding I could not thus introduce variola, I had two young cows inoculated with vaccine virus taken from the arm of a fine healthy child on the eighth day. Both cows had slight fever and local inflammation on the third day; in one, a vesicle formed on the fifth day, from which two children were inoculated, and, in both instances, the operation was followed by local and slight constitutional effects: but the pustules were elevated and opake; they had no areola, and ran their course in five days, evidently spurious; consequently no attempt was made to carry this experiment farther.

On inquiry amongst the natives, I learned, that the cows in Bengal are subject to a disease, which usually makes its appearance about the latter end of August, or early in September, to which the same names are given as to variola in the human subject, viz. Bussunt, Mhata, or Gotee; and, on the 24th August, I was informed, that several cows, belonging to a native at Moidapore, were affected. I consequently determined on again attempting to regenerate the vaccine virus from the original source.

The animals which were at first affected, amounting in one shed to eighteen or twenty, had been for a day or two previously, dull and stupid; they were afterwards seized with distressing cough, and much phlegm collected in the mouth and fauces. The animals had apparently, at this time, no inclination for food, or, at all events, they were unable to satisfy their hunger: their sufferings seemed to be greatest on the 5th and 6th days, when there was considerable fever, and pustules made their appearance all over the body, especially on the abdomen, which terminated in ulceration, the hair falling off wherever a pustule had run its course. The mouth and fauces appeared to be the principal seat of the disease, being, in some instances, one mass of ulceration, which, in all probability, extended to the stomach and alimentary canal.

In those cases, where the mouth was very much affected, the animals died, apparently, from inanition; whereas, in those cases, in which the power of mastication, or even of swallowing, was retained, recovery was much more rapid, than might have been expected, from the previous severe sufferings and reduced state of the animals: the mortality may be calculated at from 15 to 20 per cent.

From the above description of the disease, the Board will immediately observe, that it assumes a much more serious complexion in this country than we have been taught to believe it does at home. I

say taught, because, I presume, it has fallen to the lot of few to witness the disease in England; and it must be inferred from Dr. Jenner's, and other medical writings on this subject, that the animal not only continued to secrete milk, but, that the milk was used; while, in this country, the little that is secreted, is never made use of, and perhaps, owing to this very circumstance, the guallahs (or milkers) in India are not affected with cow-pox, as is the case with this description of persons in Gloucestershire, and other countries in England, where the disease is most prevalent.

It is an extraordinary fact, and worthy of remark, that, while the cows were thus affected, no case of variola amongst the natives in the village presented itself; and, although the people were ardently averse from handling or going much amongst the cattle, at the time of disease, still, they all scouted the idea of infection, stating, they never heard of any one contracting disease from the cow; consequently they were under no alarm on that score.

In consequence of the extreme jealousy, with which all my inquiries on this subject were watched by the Hindoos, coupled with my own anxiety to conceal the object in view, I should have found very great difficulty in prosecuting my investigations, had not the disease assumed the character of an epidemic, all the cattle in the neighbourhood becoming affected, and, amongst others, two belonging to one

of my own vaccinators. I had them covered with blankets, leaving merely the udder and teats exposed to the air: on the seventh day, two small pustules made their appearance on the teats of one, which dried up on the 10th, and the crusts were removed on the 12th day.

From those crusts, eleven native children were inoculated; no effects whatsoever were produced on six of this number; two had very slight inflammation on the arms, on the third and fifth days; two had considerable local inflammation and slight heat of surface, on the fifth, sixth, and seventh days; but no vesicle formed, although there was marked induration round the puncture. The remaining child's arm was slightly inflamed on the fourth morning, and a vesicle was apparent the next day, which continued to increase till the 9th day, when I was much gratified to find, that it assumed all the characteristics of true vaccine.

The poor little child, the subject of this experiment, was about five months old, and suffered much from fever for four days, by which he was greatly reduced, but very soon recovered.

Two children were vaccinated from this patient, with the most complete success; but the symptomatic fever was more severe, than I have ever observed it, in former instances. Five children were vaccinated

from those just mentioned, and the result was equally successful; after which, no difficulty was experienced, in disseminating the disease.

With the view, however, of satisfying myself that true cow-pox was introduced, I had two of the children who had been vaccinated with the fresh virus, inoculated with small-pox, and both were happily found to be secure. Another instance of the preservative powers of the new lymph deserves mention.—Five children, in the Gorah Bazaar at Berhampore, were vaccinated, and shortly afterwards, were accidentally exposed to variolous contagion, by residing in the same huts where the disease was raging very dreadfully; but not one of those vaccinated was in the slightest degree affected by variola.

Many of the children belonging to His Majesty's 49th Regiment, and others in the families of the Residents, both Civil and Military, at this station and its vicinity, have been vaccinated with the regenerated virus: my friend Dr. French, (who invariably has recourse to Bryce's test,) Mr. Skipton the Superintending Surgeon, and several other Medical Gentlemen, have expressed themselves completely satisfied with the result.

It is a gratifying fact, that since the introduction of the new lymph, the symptomatic fever has been more marked, and the Natives have much greater con-

fidence in the efficacy of the operation ; in proof of which I need merely mention, that the number presented for vaccination, within the last three months, has much exceeded that of any similar period, for the previous two years.

Variola has been more or less prevalent in this neighbourhood, for the last seven months, and is now committing dreadful ravages in several parts of the city. Many instances are daily presenting themselves of the disease attacking those, who have been previously affected, either naturally, or by inoculation ; and I am credibly informed, that several of the latter have fallen victims to this dreadful scourge. It is melancholy to reflect that a set of ignorant and mercenary beings, (such as the tikadars in this country,) are permitted annually to regenerate the disease, and thereby keep up a continual source of contagion, by which thousands of lives are sacrificed.

Accompanying, I have the pleasure to send some vaccine crusts, and ivory points, armed with virus taken two days since, from which, I entertain no doubt, the disease will be readily introduced in Calcutta ; and should more be required, it shall be immediately supplied.

I take this opportunity of acquainting the Board, that I have applied to Government for one month's leave of absence from my station, to visit the Presi-

dency, which I hope to reach by the 12th proximo, when it will afford me much pleasure to yield any farther information that may be required on this interesting subject.

Moorshedabad,
29th Nov. 1832.

SOME ACCOUNT

OF THE

BRONCHOCELE, OR GOITRE OF NIPAL,

AND

OF THE CIS, AND TRANS-HIMALAYAN REGIONS.

By M. J. BRAMLEY, Esq.

Presented 3rd November, 1832.

PART I.

The geographical limits within which Bronchocele prevails. Its comparative prevalence in the different countries. The characters, and the intensity of the disease.

Before my arrival in Nipâl, I was familiar with the various forms of Bronchocele in Europe, having resided for eighteen months in Switzerland, where, in many districts, this unsightly disease is known to be very prevalent: this advantage enables me to state, that as far as regards external appearances, the disease is the same in Europe as in Asia.

In the latter continent, where it is generally recognized by the name of *ghéga*, nothing seems to be ascertained respecting its chronology, except that its

antiquity transcends all historical record, as indeed it would appear to do elsewhere, for Pliny observes, *en passant*, in the north of Italy, that the women wore necklaces of amber, as amulets against the influence of this disease. It is, however, extensively prevalent in these regions ; for I have traced it myself by personal observation and enquiry, from the left bank of the Ganges, in the plains of Hindoostan, almost to the northern boundaries of Tibet, and have followed it thence, by means of the casual notices of authors, to the north-western frontier and north-eastern confines of the Chinese empire, and even beyond them, into the Russian territories. Perhaps the best express definition of the limits within which it prevails in the plains of Hindoostan, which I can offer, is that noticed by Captain Turner.—"It may be traced," says this author, "from the frontier of Assam, which I reckon to be in the 27th degree of north latitude, and 91st degree of east longitude, through Bijnee, Cooch Bahar, Rungpore, Dinagepore, Purnea, Tirhoot, and Betiah, along the northern boundary of Oude, in Gorruckpore, Barraitch, Pilibeat, and on the confines of Rohilcund, to Hurdewar, which is situated in 30° north latitude and 78° 25′ east longitude*. Dr. Gillan records its frequency and severity in the country between the great wall of China and Zehol† ; Marco Polo attests its existence

* Turner's Embassy to the Court of the Teshoo Lama, p. 87.

† Sir G. Staunton's Account of Lord Macartney's Embassy to China, vol. 2nd, p. 202.

and intensity, at Yarkund*; and I have the testimony of Tibetan sojourners in the valley of Nipâl, that it is found in the Tibetan and Mongolian districts, lying midway between the above extreme eastern and western points. Beyond the Chinese limits, M. Brun vouches for its prevalence in the districts around the Baikal, and also in that of Kirensk on the Lena†.

Authorities might be multiplied to establish the fact, that Bronchocele is greatly prevalent in the more remote Trans-Himalayan regions; but as I have no professional or personal knowledge of the disease in those distant countries, and shall make no further use of the fact in the subsequent part of this essays than merely to strengthen a general inference from the physical circumstances of their population (an inference too sufficiently established from the condition of the more neighbouring Tibetans, of whom I have some personal knowledge,) I shall proceed to that country, which is the centre of my observations, and indeed the only theatre of my professional practice and experience relative to Bronchocele. That country is Nipâl Proper, and especially the great valley which forms the most populous and largest part of Nipâl Proper.

In the great valley of Nipâl, and the borders of the adjacent mountains, the disease is remarkably

* Malthe Brun's Geography, vol. 2nd, p. 471.

† M. Brun's Geography, vol. 2nd, p. 440.

prevalent. Men, women, and children of all ages may be seen as subjects of it ; and it is by no means uncommon to find animals, such as the buffalo, goat, sheep, and dog, similarly affected.

Before I proceed to inquire into the prevalence of this disorder, it is necessary for me to observe, that any thing like a census of the population being unknown to the Nipâlese, I had no means of ascertaining with correctness the total number of inhabitants in Nipâl Proper : but as an estimate of some part of their country may serve the purposes of this investigation, I venture to introduce the following statistical sketch, which, as far as regards the valley of Nipâl, might enable an arithmetical politician to reach at least an approximation of the real extent of its population.

The valley of Nipâl*, situated in 27½° north latitude, and elevated about 4500 feet above the level of the sea, with a diameter either way of about sixteen miles, though broken into numberless irregularities, exhibits upon the whole a greater extent of cultivation within a given space, than could perhaps be found elsewhere. The whole, in fact, is under the plough, and solely devoted to the raising of human food, and that notoriously of the most productive kind, viz. rice, all of which is destined for the con-

* For a detailed account of this valley, see the works of General Kirkpatrick, Dr. H. Buchanan, and Hamilton's Hindoostan.

sumption of the inhabitants themselves. It possesses three considerable cities, and 226 towns and villages, and upon the whole, as may be expected, from the above premises, is one of the most populous districts in the world of the same extent. It appears from returns, which my friend Mr. Brian Hodgson has kindly favoured me with, that the number of houses contained within the valley is 41798. Out of this number, the three principal cities contain 21126, in the following ratio: Kathmandu, 10767, Bhatgang, 4700, and Patan, 5659.

Allowing seven souls to each house, this would give a grand total of 292586. When, however, it is considered, that the habitations of the Newars or aborigines, (who of course form the majority,) consist for the most part of massive brick elevations, seldom less than three stories, and that many scattered houses must have been overlooked, it is probable, that the allowance here given, falls short of the real number.

In the three above-mentioned cities, the diseased bear but a small proportion to the sane, in comparison with the ratio of the immediate neighbourhood and surrounding country. The result of some calculations, which I caused to be made, enables me to affirm, that the lowest rate of percentage for Goîtres amongst all the inhabitants of these cities was for Kathmandu $3\frac{1}{4}$, for Bhatgang and Patan 4, per cent. The difference between the former and the two lat-

ter may be ascribed to that city being the seat of government; it being a notorious fact, that Bronchocele is more prevalent amongst the lower classes, than the higher. According to calculations made of 12 of the minor towns and villages, within the valley, the average percentage was rather less than 11 per cent.; and from the subsequent and repeated inquiries I made, I am led to believe, that the above may be considered a fair ratio of the number of cases to the gross population*. These facts then would appear to confirm the statement of those authors who have observed, that the inhabitants of populous cities and towns are less liable to become affected, than those residing in detached situations, and in small villages.

In some particular villages, in the neighbouring mountains, and on the borders of the valley, elevated more or less from 500 to 2000 feet above the level of the valley, the prevalence of Bronchocele is very remarkable. The percentage was at Phirphen, 15—Màta Pirtha, 15—Chitlong, 40—per cent. and at a small village, named Carphu, which is situated on the crest of a high mountain, 48 individuals had the disease, out of a total of 53. These were all counted by myself, and the numbers include men, women, and children, excepting only those in arms.

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* Excepting only the inhabitants of the three large cities already noticed.

That the reader may be reminded how completely the foregoing facts are opposed to the generally received belief among Europeans, who have treated on this subject, I must beg leave to insert the opinions of the most able writers*. Saussure, Ferrus, Georget, and all those who have a personal knowledge on the subject, acknowledge, that "at a certain height (five or six hundred toises), among the Alps, Goître and Cretenism disappear." "In short, we find in the vallies, and in the lower gorges or ravines, that open on its sides, both Cretenism and Bronchocele in the most intense degrees: as we ascend the neighbouring mountains, Cretenism disappears, and Goître only is observed; and when we get to a certain altitude, both maladies vanish." The opinion of Foderè would seem to correspond with the above†. "Quant à-present, il suffit d'enoncer que la Goître est une maladie particulière aux habitans des bas fonds des vallés qui sont au pied des diverses grandes montagnes qui divisent les contrées des l'Europe."

I have no remarks to offer, with a view of explaining why this difference should exist, in regard to the locality of the disease.

My chief object in noting the circumstance is to place those, who have devoted much time to this

* Cyclopedia of Prac. Med. p. 327. Art. Bronchocele.

† Traite du Goître et Cretenisme, p. 60.

particular subject, in possession of facts, which have a tendency to open a new source of speculation, by which some clue may be afforded towards the discovery of the intrinsic cause or causes of a disease as yet but little known. I may further add, that I have witnessed its prevalence amongst families who habitually reside on, or near, the summits of mountains not less than 7000 feet above the level of the sea; and if the authority of the Trans and Cis Himalayans may be depended on, I have the concurrent testimony of many, that it may be found nearly in the same proportion amongst the scattered inhabitants of the highest habitable points of the Himalayan range.

There are some towns and villages within the valley where Bronchocele is never known to be very prevalent, though the people who dwell in their immediate vicinity may be particularly liable to it. One, in which I noticed this, was Sanchù, a considerable town, situated on an eminence, and surrounded by a luxuriant forest, which rises from a range of hills, by which it is anteriorly and laterally bounded.

In this town, where the inhabitants may be estimated at about 3000, I counted 600 of them; none of whom appeared to have a vestige of the disease; and I was informed, by one of the residents, that not more than a dozen were so affected. I remarked the same at Loovhú, a town situated on an open ele-

vated plain, and surrounded by fields destined for the cultivation of grain. Not more than two per cent. of the inhabitants had the disease.

The prevalence of Bronchocele is far more conspicuous in the plains of Hindoostan, than elsewhere. It may be traced as an endemial affection from the left bank of the great Gundûk river, though here it would seem to be very partial. Mr. Evans, in his paper on the Medical Topography of Tirhoot, observes, "It is not uncommon to see villages situated on the banks of the Gundûk, contiguous to each other, the one with scarcely an individual exempt from the complaint, while in the other, the inhabitants are perfectly free from it*." This corresponds with information which my friend Mr. Fitzgerald has kindly supplied me with: amongst the people employed in his factory, at Loll Gunge, Singhia, which is situated close to the left bank of the Gundûk, not more than two in a hundred have the disease; though in a village not very far distant from the former, no fewer than fifty were affected by it, out of a total of a hundred and fifty.

The nearer you approach the foot of the Nipâl range, the more does the prevalence of the disease become apparent: so great, indeed, is the abundance of it in the countries noticed by Captain Turner, that he asserts not less than one-sixth of the gross

* Medical Transactions, Calcutta, Vol. iv. p. 246.

population to be the subjects of it. I have myself the returns of three villages in the neighbourhood of Betiah (about 50 miles distant from the foot of the hills), which shows that with respect to this particular part, Captain Turner's estimate is even within bounds.

Names of the villages.	*Number of Inhabitants.*	*Number with Goître.*	*Number without Goître*	*Remarks.*
Chouby....	234	65	169	
Maha-deo..	236	103	133	14 children under 10 years of age had the disease.
Loll-Seria..	177	65	112	2 children ditto ditto.
Total.....	647	233	414	

In the tract of country recognized as the Terrai or Terriani, but more particularly that part which is contiguous to the great forest (Bhaber), scarcely an individual is exempt from the disorder.

The opportunities of drawing out, any thing like a satisfactory statement of the comparative prevalence of Bronchocele, can so seldom occur, that I trust no apology is due from me for having occupied so much space, in detailing the foregoing particulars: but before I pass on to a brief notice of the disease, and its varieties, it is incumbent on me to state, that the numbers given can only be received with certain limitations; for when it is considered, that I was an attaché of a political functionary, one of whose chief duties it is to avoid the Argus-eyed jealousy of Europeans, characterizing the court to which he is accredited; and that I was entirely un-

acquainted with the peculiar languages spoken by the various tribes of mountaineers, I trust it will be felt, that there existed almost insuperable obstacles to the full investigation of my subject. I have however the satisfaction to add, that from the time and labour which was expended by those who assisted me in the irksome task, the returns are sufficiently correct to warrant the conclusions I have arrived at.

Bronchocele or Ghéga, consists of an indolent enlargement of the thyroid gland, which occasions a swelling on the front and lateral parts of the neck. When the tumor reaches a large size, its weight occasions the surrounding skin to loosen, and in such instances, it becomes pendulous, and will sometimes descend so as to rest on the breasts; more frequently, however, the enlargement projects anteriorly, and is carried forward beyond the chin, remaining tightly bound by the skin with which it is enveloped. The shape of the tumour varies according to the nature of its consistence; thus some are firm and elastic to the touch, whilst others may be soft and flabby; sometimes the surface is irregular and shapeless, at other times it is smooth and uniform. These are the general appearances when the disease occupies the whole of the gland: but it may frequently happen that only one lobe is affected. In cases where the middle lobe (or portion) alone is the seat of disease, the swelling is prominent, and for the most part spherical; it occupies the front of the neck, its lateral boundaries generally terminating

opposite either edge of the sterno-cleido mastoidei muscles. When either of the lateral lobes are diseased, the swelling takes place on the side of the neck. In every form of the disease, it seldom fails in the course of its growth to become a conspicuous deformity.

Except in some extreme cases, it is not productive of constitutional disturbance; but it does occasionally happen, that either owing to its enormous size, or from the circumstance of the development of one or both lobes taking place in the interior (Goître en dedans), it causes undue pressure on the trachæa, or may obstruct the free return of blood to the heart. In such cases, a train of distressing symptoms result, such as vertigo, partial or total loss of voice, constant head-ache, and embarrassed respiration, even so as to threaten suffocation.

In individuals of sound and robust constitutions, its growth is usually tardy; but when it attacks persons (more particularly females) of delicate temperament, or such as are debilitated by overgrowth, or otherwise diseased, I have remarked, that its increase is proportionally rapid.

The arteries and veins enlarge as the size of the swelling increases. It must not, however, be inferred, that the vessels themselves participate in the disease; their enlargement merely depends on the size of the morbid growth, which they are called on

to nourish; as we find, that when the disease is under progress of cure, in proportion to its decrease, is the gradual return of the vessels to their original size.

The situation of the arteries is variable; sometimes the superior thyroideal arteries are seen pulsating and ramifying over the surface of the tumor, and being then almost subcutaneous, there is no difficulty in observing their increased diameters. At other times only one of the arteries will be superficial, while the other is deeper seated; but the most common position is their being both embedded in the substance of the diseased mass; in which case, it is not easy to distinguish their pulsation from that of the carotids. The subcutaneous veins in like manner enlarge, and usually become, as the disease advances, more or less varicose.

It is commonly admitted, that it reaches a much larger size in women than in men. So far as regards my observation of the disease, I am enabled to add my confirmation to this.

The largest I ever saw in a man, was in a native, of high birth and rank, who resided at Patna: but of all those I measured in Nipâl, the circumference of the neck, over the broadest part of the swelling, did not exceed $22\frac{1}{2}$ inches, and this was the largest by two inches, of all that fell under my observation: whereas, in a woman, who underwent a course of treatment for several months, the circum-

ference of her neck, when she first applied to me, was $25\frac{3}{4}$ inches.

It is generally supposed, that women are more liable to the disease than men, even (as stated by one author) in the proportion of 10 to 1*. How far the result of my inquiries on this point correspond with the above may be seen by a reference to the subjoined return:

Town of Handigang.

Inhabitants.	*Without Goître.*	*With Goître.*	*Total counted.*	
Men.....	325	29	354	
Women.....	340	31	371	
Boys.....	169	3	172	Males to Females, 32 to 33.
Girls.....	145	2	147	Percentage on the whole $6\frac{1}{4}$.
Total.....	979	65	1044	

Town of Dèopatan.

Inhabitants.	*Without Goître.*	*With Goître.*	*Total counted.*	
Men.....	474	34	508	
Women.....	411	38	449	
Boys.....	218	5	223	Males to Females, 39 to 44.
Girls.....	269	6	275	Percentage, $5\frac{3}{4}$.
Total.....	1372	83	1455	

It appears by the above, that in the town of Handigang, the proportion of women to men is thirty-three to thirty-two, and in Dèopatan forty-four to

* See Holbrook on Hydrocele and Bronchocele, p. 59.

thirty-nine; and taking it for granted, that there were more men than women absent in the fields, it is reasonable to infer, that there is little or no difference between them. It is, however, necessary to remark, that had not each individual been actually examined, the numbers might have been very different; for in many of the men the enlargement of the gland was so trivial that without a careful inspection, the disease would have escaped observation.

It is frequently so partial amongst men, that many are not aware of its existence. I had many striking examples of this in the Bhotea inhabitants of both the Trans, and Cis-Himalayan regions, who annually visit Nipâl. On being asked, whether the disease was very prevalent in Bhote, the usual reply was, that all the women have it, but very seldom the men; yet upon examining the necks of these very individuals interrogated, the thyroid gland was, without an exception, more or less enlarged.

No period of life is exempt from the disease; children are sometimes born with it, as are also animals. Several instances of the latter occurred during my residence in Nipâl; on one occasion, a goat brought forth a kid, with a Goître as large as its head. Puppies of a month old, bred from English dogs, are very frequently affected by it, as also are lambs.

The proportion of children to grown up persons was as follows. In 124 males with Goître, the num-

ber of boys, under 10 years of age, was fifteen; and six of this number, were under six years of age. In 140 females, the number of girls was fifteen, three of whom were under four years of age, and all under 10. In these children, the tumors were sufficiently large to attract common observation; they were counted by a sepaihee, who did not subject any of them to examination ; it is probable, therefore, that the number of children affected, bears a larger proportion than the one I have given.

It is the general belief of most writers, that the age of adolescence, or thereabouts, is the most favoured period for the development of Bronchocele; and so far as my inquiries went in Nipâl, I can add my confirmation to this opinion. I have, however, met with many examples, where according to the patient's own accounts, the disease has not appeared till the ages of 40, 50, and even 60 years. How far the veracity of these witnesses is to be depended on, I cannot pretend to say, being, for the most part, liable to just suspicion.

Much difference of opinion has at various times existed as to the precise nature of the tumors, but of late years, the writers on this subject seem to agree, that their consistence and composition are not always alike; in fact, that there are different species of the same disorder; so that when describing them, it has been customary to divide them into such varieties as external examination enables us, in most

instances, to determine. These varieties are so distinctly marked in Nipâl, that I am induced to adopt a similar arrangement, chiefly, however, with a view of facilitating the description, as I have occasion to speak of them separately, in my remarks on the treatment of the disease.

That which is by far the most common, is the cellular, which is denoted by a shapeless extuberance, having an irregular and lobulated surface, apparently consisting of a congeries of cells, in close adaptation with each other. This variety usually attains a very large size, though its progress towards maturity is tardy. The size of the cells doubtless varies in different subjects, and if any judgment can be formed from their external appearance and feel, I should say, that in some instances their capacity was equal to that of a pigeon's egg. It is these large cysts or cells which give to the tumor its lobulated appearance.

I am not prepared to give an analysis of the contents of the cysts, since the opportunity I had for acquiring any knowledge of the pathological anatomy of the disease was so limited (being merely derived from a dissection of a few specimens removed from animals) that no general inference can be drawn. Those which I inspected were all incipient; they were apparently composed of every minute cells, so closely connected together, that they seemed to constitute the greater part of the diseased

mass. On making a section through them, a transparent viscid fluid exuded.

The second variety is the pulsating, which though of common occurrence, is less frequently found than the preceding. The tumours in these cases have a pulsatory motion, corresponding with the action of the general circulation. In some it is so powerful as to be detected at a distance of several yards; while in others a closer examination, or the application of the hand, is requisite to distinguish it. The pulsation is not merely confined to the trunks of the superior and inferior thyroideal arteries, but seems to be generally distributed through the diseased growth. If, in this variety, the disease is confined to only one of the lateral lobes, it bears a close resemblance to an aneurism of the carotid artery*. Mr. Holbrook mentions one instance in which this mistake occurred, which was not detected till his opinion was solicited as to the propriety of tying this artery. The surface of the tumour is generally smooth and regular, it assumes various shapes, and is remarkable for the rapidity of its growth.

The glandular or lymphatic variety is the third, but I need not dwell on this, as its appearance is similar to the last, only that it is devoid of pulsation.

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* See Holbrook on Hydrocele and Bronchocele.

Dissection has proved, that the tumors may partake of one or all of these varieties; that also the lymphatic glands may participate in the affection; that the nature of the fluid, contained within the cysts, may be sanguine, purulent, gelatinous, or aqueous, or they may be steatomatous throughout; and it is not surprising, that in those of long standing, in aged persons, cretaceous or osseous matter has been found deposited, in a greater or less degree. All these appearances are, no doubt, to be found in Nipâl as elsewhere, but as I have no personal knowledge of the fact, it is foreign to my design, to extend my inquiries on this point.

Professor Walthur, in his classification, has added the inflammatory and the scirrhous. I am disposed to believe, that when any symptoms of active inflammation exist, that the tumor will always be found to be pulsatory, at least I have always found it so; with reference to the scirrhous, none that I met with or heard of have ulcerated spontaneously, neither have they borne any legitimate traces of malignancy. Nevertheless, the result of experience fully sanctions the conclusion that they may, and do, sometimes become scirrhous. We have numberless examples of harmless tumours presenting themselves on various parts of the body, which, in course of time, have taken on this disease; and excepting, perhaps, the first twenty years, there is no period of life, exempt from that peculiar defect in the constitution, which favours the development of malignant disorders, and

an already injured or diseased part is the most likely spot for it to fix itself on.

PART II.

Concerning the Causes of Bronchocele.

Without purposing to enter into a lengthened disquisition, upon the several theories which have been proposed to explain the origin and character of Bronchocele, it will still be necessary for me at least distinctly to enumerate many of them, in order that the bearing and application of the numerous insulated, but decisive facts, which I have been enabled to glean among the various and variously situated races inhabiting the limits previously laid down, as those within which I have represented Bronchocele to exist, may be more readily seen and appreciated: for it is my chief object in this part of my paper summarily to test the theories by the facts.

Were it required, the country of Nipâl would furnish abundant evidence in disproof of the opinion, that the disease is produced from drinking water supplied by the melting of snow ; but no arguments are now necessary to refute a notion which, (though it was once the favourite doctrine,) was finally discarded on the announcement, that Bronchocele was very prevalent in Sumatra, where snow never falls, as also the fact that in Greenland, where snow-water is commonly used, the disease is unknown.

This supposition was succeeded by that which attributed the origin of the disease to the drinking of water impregnated with certain salts. The supporters of this theory, however, failed to establish it as a universal cause; for when the waters of several districts in England, where the disease is endemial, were analyzed, it was found, that the earthy or other impregnations, which entered into their composition, were wholly unlike each other. It is therefore scarcely necessary for me to offer any remarks on the waters of Nipâl, to prove the fallacy of this doctrine; lest, however, there should still be some who advocate it, I subjoin the following particulars of the principal waters, which the inhabitants drink, for the analyses of which I am indebted to the kindness of my friend Mr. James Prinsep.

Examination of seven sorts of Water from Nipâl.

Number.	*Name or locality.*	*Appearance on opening the bottle.*	*Specific gravity. Pure water being 1000.00*	*Salts on evaporation of* 1000 *parts.*						*Result.*
				Insoluble deposit on boiling.			*Soluble salts separated.*			
				Carbonates of		*Sulphate of Lime or Silex.*	*Sulphate of Soda.*	*Muriate of Soda.*	*? of Iron.*	
				Lime.	*Magnesia.*					
1	Lâl Serai,.....	Yellow tinge.....	1001.64	0.3	0.5	none	0.5	0.4	none	hardwater
2	Máhádeo,.....	Clear.....	1000.37	slight 0.1 ?	——	slight 0.2 ?	0.04	0.02	do	common.
3	Bishenmutti,.....	Yellow tinge.....	1000.03	0.03	——	none	none	none	do	pure.
4	Bághmatí,.....	Do. and muddy....	1000.11	very	small.	none	none	0.03	slight trace	nearly pure.
5	Spring at Sanchoo,	Clear, sulphureous smell....	1000.47	hardly	any dep.	none	small	0.20	trace	common.
6	Spring water used at Kathmandú,..	Rather yellow, but sweet.....	1000.00	very	slight.	none	none	none	none	pure.
7	Ditto at Karfu,.....	Ditto ditto.....	1000.08	0.03	trace	none	none	0.04	none	do

2nd Nov. 1832.

JAMES PRINSEP.

Remarks on the Nipâl Waters, by James Prinsep, Esq.

"Of the seven specimens of water, brought from various places in the valley of Nipâl, none can be properly called a mineral water; they were submitted to examination, to ascertain whether any and what difference prevailed among them, and if the influence of such difference of composition would account for the prevalence or absence of peculiar local disorders."

"The exceedingly minute amount of saline or earthy matter in most of them is sufficient of itself to discountenance any such idea, unless indeed pure water should itself cause peculiar effect on the constitution."

"The specific gravity of each specimen was taken in the most careful manner, by immediate comparison with distilled water of the same temperature, and in no case but the first (viz. that of the Lál-Serai water) did the solid contents amount to a two-thousandth part of the whole; the subsequent chemical examination, to which they were submitted simultaneously, was conducted as follows: 2000 grains weight, were evaporated to dryness, and the residue redigested in distilled water: the soluble salts were treated for sulphates and muriates with the nitrates of barytes and silver: the insoluble part was taken up in part or wholly with nitric acid, and then tested for lime and magnesia. Nothing in the course of examination conduced to make a more scrupulous

analysis necessary. No. 5, from Sanchoo, was the only water which had a sulphureous odour when first opened. The sulphuretted hydrogen was taken away by putting a clean slip of pure silver into it, which became discoloured, but the increase of weight was not ponderable: the same water under the air pump gave out $\frac{1}{100}$th of a cubic inch of gas from six cubic inches of liquid: the proportion given out by No. 1, was $\frac{1}{40}$ of a cubic inch of common air; it did not seem worth while to try the others."

"The preceding Table shews the results of my experiments in the most succinct form. Perfect reliance must not be placed on the quantitative amounts, as the matters operated on seldom exceeded two-tenths of a grain; and as the acids alone in the soluble salts were separated by their respective re-agents, the alkalies, with which they might be united, have been assumed, as those most commonly found in solution."

As regards the influence of *particular* water over the disease, a celebrated physician of Geneva asserted, that distilled water prevented the increase of the tumours, and even tended to lessen their bulk*. To show that some importance was once attached to this opinion, I remember, in the year 1818, that when two

* Observations on the Remarkable Effects of Iodine, by J. R. Coindet, of Geneva, p. 3.

English youths, who were fellow pupils of mine, in Geneva, were attacked with Bronchocele: one of the principal medical directions they received, was not to drink any water that had not been previously boiled. Whatever may be the value of this precaution in certain parts, experience has failed to prove its general efficiency; and as no one has ventured to announce as a universal proposition, that distilled water, or water deprived of all impurities, will prevent the occurrence of the disease, the aqueous theories, I fear, are not likely to conduct us, to the discovery of the essential cause of this hideous disorder. It is, nevertheless worthy of remark, that the Nipâlese unanimously agree, that the sole cause of Bronchocele is the water drank by the inhabitants affected, not because such water is supplied wholly or partially by the melting of snow, but in consequence of its being tainted with certain impurities, which none of them have attempted to define. It must not, however, be inferred from this, that the water of Nipâl is perceptibly bad: on the contrary, that which is used for drinking is to appearance and taste of the purest kind. Formerly an idea was prevalent amongst them, that the disease arose in consequence of their imbibing a noxious insect, which generated in the water that they were in the daily habit of using; but an idea still more consistent with their superstitious notions is mentioned by General Kirkpatrick, "That the Goîtres in the two towns of Hurrigang and Dèopatan were gravely believed by many of the inhabitants to be an effect of

imagination in their pregnant women, who were constantly exposed to the disgusting sight, presented in the protuberant pouches of the innumerable monkies, with which the adjacent grove of Guhyèwari swarms*."

That a low, an innutritive diet, is one of the chief causes of Bronchocele, is an opinion, which until lately, had received many able supporters. So late an author, as Dr. Mason Good, seems to have been

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* As Bronchocele was formerly supposed to be a symptom of Cretinism; or that there was some indistinct connection between these two diseases, it is fit I should remark, that Cretinism, or any thing approaching to it, is not known in Nipâl or its immediate vicinity. So far as my own observation went, I never saw a case of congenital idiocy, neither did I observe any of those malformations, as rhachia, &c. which are supposed to arise from a deficiency in the *materiel* essential to the due solidity of the bones of the body. It may also be stated, that in Nipâl, those who were the subjects of Bronchocele were nowise remarked as individuals of weakened or impaired intellects.

In the plains of Hindoostan, there are many Idiots, but they are not Cretins. Some of these are afflicted with Bronchocele, others are free from it. There is however some reason for believing, though it is not distinctly stated, that Cretinism or something allied to it is to be found in some districts of the northern frontier of Chinese Tartary, for the following passage appears in Sir G. Staunton's Account of Lord Macartney's Embassy to China. Speaking of the large necks found in these parts, the author observes, "But the minds of many of them were much weakened, and perhaps of all in a less degree. Some were reduced to a state of absolute idiocy. These objects are considered, in some degree, sacred, and they are maintained by their families with peculiar care."

one of its firm advocates. "After a visit he made to Matlock," he says, "that those affected by this disease, were not only exposed to all the ordinary evils of poverty, but derived their chief diet from that indigestible and innutritious substance, the oaten cakes of Derbyshire, which is probably the chief cause of all the glandular and parabysmic enlargements, which are so common to that quarter."

To explain the observations which presents themselves upon this theory, it is necessary that I should divide the limits over which I have represented Bronchocele to be found into three principal divisions, as it is my intention to offer a few facts respecting the diets of the various races which inhabit the space contemplated.

These divisions are—first, the plains of North Behar, between the Ganges and the mountains. Secondly, the plains of Tibet, as far as Lassa and Digurchee. And thirdly, the central mountainous tract lying between the two first, and extending from the champaign of India to that of Tibet.

In the plains of Tibet, an almost entirely animal diet prevails; in those of India, one nearly exclusively vegetable; and in the central mountainous tract, a mixed diet. Nowhere is the food notoriously insufficient in quantity, or noticeable bad in quality.

The Tibetans or Trans-Himalayans are copious but gross feeders, their soil and climate being as injurious to vegetable as favourable to animal life. They are of necessity chiefly confined to the flesh of animals for food. They have oxen, sheep of a remarkably fine species, and goats, as well as game of all sorts in abundance, and upon the flesh of all these, raw, as well as dressed, they feed four times daily; viz. at sunrise, at about 9 A. M., at 4 or 5 P. M., and again shortly after sunset. Mixed with their flesh-food is a sprinkling of farinaceous substances, chiefly the flour of a peculiar bearded wheat called by them Ouah. They take tea in large quantities, and assert, that the use of it is with them essential to free digestion. The tea they consume is much coarser, and altogether different from ours, as is also their mode of preparing it. They infuse the triturated substance itself of the leaves; yet further inspissating the semiliquid with rancid lard, and with the flour above alluded to; and the small portion of farinaceous aliment which can be taken in this form is all they can procure.

Milk would not seem to be a favourite with them, though they of course consume it in considerable quantities, having such large herds. With fermented liquors, they are little acquainted. Spirituous ones, distilled principally from grain, they have, and freely use, though I am not aware that they are notoriously addicted to inebriety. Unlike the Mon-

gols and *Tartars*, they detest the milk of mares either simple or distilled.

The natives of that portion of the plains of India, which is within my scope, have the well-known habits in respect to food, peculiar to the whole continent. Their staple food is rice, which they season, as usual, with very hot condiments; and though few of them can touch spirituous or fermented liquors, not a few suppose, they evade the letter of the law, at least by the substitution of strong drugs for strong waters. Tobacco in particular is very much smoaked. Many of then use as much animal food of particular licit kinds as they can afford: but upon the whole, their food is grains and fruits, their beverage water, and their habits remarkable for temperance.

In respect to the mountaineers dwelling between the two last named races of people, these may be characterized generally as being less temperate in their diet than the Indians, though more so than the Tibetans. The majority are not Brahminical Hindoos, and those that are so, cannot be brought to make their food square with their creed, save only in so far, as they will not touch beef. This Brahminical section of the mountaineers eat as much of the flesh of goats, deer, and game, as they can afford; many adding sheeps to the catalogue, and washing down their food with pretty free libations to Bacchus. But, upon the whole, their food is principally vegetable, and their habits in respect to eating and

drinking temperate, certainly so as compared with most European nations. They compose the now dominant classes of the population, and are consequently well provided for. Those (the great majority) who are not even ostensibly attached to Brahminism have scarcely any legal restraints on their appetites, but as subjects of a Hindoo Government, they cannot of course touch beef of any kind ; and the Newars or aborigines of the great valley of Nipâl, and its immediate vicinity, even when not of the Brahminical sect, yet effect to show their superior civilization, by the observance of certain restrictions borrowed from that faith. These precisians reject fowls and their eggs, as well as sheep and buffalo beef. The rest (the majority) devour greedily flesh of all kinds, so far as they are able to procure it, or have the means of purchasing it ; and in general, they probably obtain as much of it, as the poorer classes in Europe. But the food of all these mountaneers is still vegetable, rather than animal ; the soil and climate being much better fitted for raising the former than the latter. Rice is the grand article of food in the valleys, but the mountainous parts seldom yield better Cerealia than Indian corn, and grains yet inferior to it. The climate and herbage of these mountains is not favourable to flocks and herds, which circumstance, more than the prejudices of the inhabitants, makes their principal food of the vegetable kind. They use as much cow's and goat's milk as they can get. With vinous liquors they are unacquainted, and are no great adepts at fer-

mentation or distillation: hence strong drinks are upon the whole, and as compared with Europe, scarce, which is I apprehend the chief cause of the mountaneers being free from the vice of drunkenness, for they are mostly people of gross habits of feeding and gross ideas. The Newars or aborigines are well acquainted with the processes of fermentation and distillation, and make large quantities of acidulent and ardent liquids, from rice and wheat, which women and children, as well as men, habitually use, but seldom to excess. A regular drunkard is a character scarcely known throughout the mountains. Tobacco is much rarer, than it is in India, but all use it who can afford it, as well as other intoxicating drugs, chiefly extracts from the hemp plant. Fruits are rare and bad, except those which are reared in some of the lower valleys, which are subject to a higher temperature than the great valley. The produce of these, however, is principally destined for the consumption of the rich. The fruit grown in the valley of Noacote* is the best of its kind, for owing to the very fruitful nature of the soil, as also its being one of the least elevated valleys of Nipâl, it is capable of bearing all the vegetable productions of the province of Behar. Those which are brought to Kathmandu in perfection are pine-apples, mangoes of various sorts, (some of which grow to an enormous size, but usually drop from the trees,

* A valley of about six miles in length, by one and a quarter in breadth, situated about 17 miles N. by W. from Kathmandu.

before they are quite ripe,) plantains, and guavas. I do not think that these fruits are surpassed in flavour by any of the same description, which are procurable in the lower Bengal provinces. The European fruits, which flourish in the gardens of the Residency in the valley of Nipâl, are strawberries, in high perfection, apples, and various sorts of plums; pears are abundant, but probably owing to a want of sun during the rainy season, they do not ripen; the same also may be observed with regard to peaches, which usually promise a good crop towards the end of the spring, but the rains commencing at a period when sunshine is most required to ripen them, they become blighted, and are seldom fit to be brought to the table. Vegetables are abundant, and many of them are cultivated with considerable success in the great valley. Amongst these are garlic and radishes, which are brought to market in immense quantities; they are very cheap, and are much relished by the commonality. Cucurbitaceous vegetables are also plentiful, and are very good of their kind. Field peas and vetches are abundant; as are also the sprouts of mustard (sirsoon and til). Lettuces, spinach, and French beans are also brought to market; these vegetables, however, are not held in such estimation amongst the populace as any of the former; they are readily purchased by the more wealthy inhabitants, for whose consumption they are almost exclusively destined. Potatoes, which were introtroduced about half a century ago, do not flourish in Nipâl Proper. They are, however, raised with

great success in the Juxta Himalayan tracts, from whence they are brought to Kathmandù, in considerable quantities. They are inferior to none grown in India, and are sold at a very cheap rate.

Upon the whole, as may be seen by the foregoing particulars, the inhabitants, which the central mountainous division embraces, have (poor as well as rich) a sufficiency of good food, principally vegetable, but with a fair share of animal also; and their habits of feeding, though gross, from want of refinement of manners, are not marked by excess in respect to either meat or drink, unless we must except the Kacharians or Juxta Himalayans, and some small sections of certain other tribes of highlanders, who are beastly feeders, not rejecting even carrion, when accident throws it in their way.

The few particulars I have here stated offer sufficient proof, that Bronchocele is not ascribable, in a universal sense, to any *particular* species of diet. The next Theory I proceed to inquire into is, that which refers the origin of Bronchocele to atmospherical causes: whether to any peculiarity of climate, the neck being exposed to the sudden currents of any particular wind, or both of these.

This, in a general sense, may be said to be the predominating notion of the present time: there is, nevertheless, a considerable division of opinion as to the probability or rather possibility of any *parti-*

cular condition of the atmosphere, being alone capable of causing the disease. The discrepancies, if I may so term them, which have arisen on this, have induced me to draw up a few facts, which are intended to show, that the circumstances of the people, inhabiting the limits comtemplated, are not less diversified in respect to climate, than as regards their food.

Dividing the plains of North Bahar through the centre, by a line drawn east and west, parallel to the mountains and the Ganges, it may be observed, that the half next the Ganges is one of the most healthy countries of the lowlands of the East, possessing no peculiarity considered as an Indian climate. In point of general salubrity, it is decidedly good. The inhabitants of this part may be regarded as a healthy race of men, with the ordinary physical attributes of Hindoos and Mussulmans.

The half next the mountains is notoriously unhealthy, probably, from the great want of ventilation, and excess of vegetation and humidity, which pervades the whole of that part which is called Terriani, but more particularly in the great forest (Bhàber), which bounds the foot of the hills. Over the whole of this tract a most pestilential atmosphere prevails for six months in the year; and so direct is its influence on strangers, that it may, with truth, be said to form a more substantial barrier to the intrusion of invaders into the Nipâlese domini-

ons, than the most rigid observance of any police or quarantine regulations could do, in virtue of its producing a malarious fever, of an aggravated kind, which the constitution, however strong, is seldom able to resist. The inhabitants, as may be supposed, exhibit many marks of the noxious vapour, which they here inhale; having a mean and stricken appearance, and being much debased in form, size, and strength. Both of these divisions of North Bahar have of course an essentially tropical distribution of seasons, and in a general sense, they may be said to proceed with the same regularity as in Calcutta. That half, however, which is next the Ganges, is not subject to the same violence of heat which characterizes the climate of the lower Bengal provinces. The winds are also observed to be more variable, and that which blows from the west, during the months of February and March, imparts a degree of coolness to the atmosphere which is not experienced in Calcutta. This, as well as the nights being less oppressive during the latter part of September and October, and the relief afforded by the storms of hail and rain during the hot season, in the early part of spring, give the climate a superiority in point of temperature and general salubrity over that of the lower provinces.

The central or mountainous region consists of an extremely irregular mass of very precipitous mountains, varying in elevation from five hundred to twenty-six thousand feet above the level of the sea; and however surprising it may seem to the Euro-

pean traveller, the habitable region extends to the vast elevation of fifteen thousand feet, and upwards, which is little short of the highest mountains in Europe.

This large tract is subject to temperatures as various, both in intensity and in changeableness, as its infinitely diversified elevations and physiognomy. The distribution of the seasons is also essentially tropical. In point of humidity, the mountainous region may be said to resemble the plains of North Bahar, being less humid than the lower provinces of Bengal, more so than Hindoostan Proper, or the Upper Provinces. As compared to Europe, it is decidedly humid. The mountains are extremely precipitous, with ordinarily very narrow intervals; and up to the point of perpetual congelation, they are almost universally covered with a deep bed of soil, which, when not dedicated to Ceres, for the most part sustains thick and ample forests of underwood and timber: probably not a fiftieth part of the surface is cultivated. In the valleys and on the lower levels, rice is the ordinary produce; and it follows, from the nature of the cultivation of such localities, that these are the most humid parts in the hills. Such amongst others is the great valley of Nipâl.

In the mountains, the prevailing winds, though it is difficult to ascertain them accurately, may be said to be those of Hindoostan Proper; they are

subject however to sudden transitions, and peculiar currents, from the extreme irregularity of the surface, and diversified elevation of the general mass. The more open and level, as the great valley, the more equable the winds, both in temperature and intensity, but even the valley is occasionally subject to sudden transitions from heat to cold, though much less so than the deep narrow glens, or the exposed mountain tops. In the valley of Nipâl, the strong and steady westerly wind, which constitutes the *hot wind* of the Upper Provinces, blows with the same regularity, and comes and goes at or near the same periods; but so much is its ardour tempered, by the local atmosphere of the mountains, that instead of its being necessary to shut it out, or meet it with a tatty, all the doors are thrown open to welcome it: its freshness is always agreeable to the feelings, and its temperature so moderate, that the thermometer, on being exposed to its influence, receives only an accession of four degrees, as compared with its height, without such exposure. This wind, in point of fact, is the only steady one which blows in Nipâl. It is succeeded by strong breezes from the north-west, not unfrequently accompanied by transient, though severe, storms of rain, thunder, and lightning, and sometimes hail. During the rainy season, which usually commences about the beginning of June, there is an almost daily variation, the winds and rain coming from any point from S. W. to due East. Upon the whole, however, the greater portion of rain may be said to proceed from the south-east; fre-

quent storms of heavy rain also come from the north; but these are always transient and of short duration, and the thermometer during these receives a temporary decrease.

The rains begin to break up about the middle of September, prior to which a gradual change in the temperature is observable, which occasions a fall in the thermometer of from six to eight degrees: and the rains ceasing about the end of this month, the climate immediately assumes a European type, not inferior to that of England, which it maintains till interrupted by the powerful sun of spring. A morning fog is the harbinger of the cold-weather and during the months of November and December, they are exceedingly dense till 9 or 10 o'clock in the day; they are, however, generally succeeded by a grateful sunshine, which at this season is never so powerful as to require more than the simple precaution of wearing a hat or cap to guard against the effects of its influence; indeed, though it may not be altogether prudent, the chattah is seldom called into requisition till the month of April. Europeans, at all seasons, dispense with the use of a white jacket, but as a more agreeable proof of the mildness of the climate, I may add, that the punkah is only known by its name.

The annexed return will show the state of the thermometer for the year 1825*. It was the only

* *State of the Thermometer at Nipâl for the year* 1825.

Months.	Inside the house.				Outside in the shade.				Remarks.
	A. M. 8	A. M. 12	P. M. 4	P. M. 10	A. M. 8	A. M. 12	P. M. 4	P. M. 10	
January, ...	$50\frac{9}{31}$	$52\frac{5}{31}$	$53\frac{24}{31}$	$53\frac{18}{31}$	$37\frac{1}{31}\frac{2}{}$	$48\frac{3}{31}\frac{0}{}$	$53\frac{2}{31}\frac{0}{}$	43	Mornings foggy. Days fine; occasional showers towards the end.
February, ...	$52\frac{2}{28}\frac{0}{}$	$53\frac{2}{28}\frac{7}{}$	$55\frac{2}{28}\frac{3}{}$	$54\frac{2}{28}\frac{2}{}$	$41\frac{1}{2}\frac{2}{8}$	$52\frac{1}{2}\frac{9}{8}$	$56\frac{9}{2}\frac{}{8}$	$46\frac{4}{2}\frac{}{8}$	Occasional fogs during the mornings. Days cloudy; transient storms, accompanied by strong west wind, rain, and thunder.
March,.....	$55\frac{8}{31}$	$56\frac{1}{31}\frac{2}{}$	$58\frac{1}{31}\frac{6}{}$	$56\frac{2}{31}\frac{7}{}$	$45\frac{5}{31}$	$63\frac{4}{31}$	$65\frac{1}{31}\frac{0}{}$	$51\frac{4}{31}$	Weather foggy in the mornings, during the early part of the month. Days fine, with strong cool breezes from the west. Occasional showers towards the middle of the month; cloudy weather towards the latter end, with short storms of rain and thunder, during the afternoons. On the 10th, a frost in the evening; 16th, snow fallen during the night on the adjacent mountain tops.
April, ...	$63\frac{1}{30}$	$66\frac{2}{30}$	$67\frac{2}{30}\frac{i}{}$	$66\frac{1}{30}\frac{6}{}$	$63\frac{2}{30}\frac{3}{}$	$78\frac{2}{30}\frac{8}{}$	$78\frac{2}{30}\frac{0}{}$	$61\frac{2}{30}\frac{6}{}$	With the exception of five days, the weather throughout the month was cloudy. Towards the afternoon and at sunset violent storms from N. W. with heavy rains and thunder.
May, ...	$68\frac{1}{31}\frac{9}{}$	$70\frac{1}{31}\frac{4}{}$	$71\frac{2}{31}\frac{5}{}$	$70\frac{2}{31}\frac{2}{}$	$70\frac{3}{31}\frac{0}{}$	$83\frac{9}{31}$	$81\frac{8}{31}$	$67\frac{1}{31}\frac{7}{}$	Weather cloudy and unsettled throughout the month; occasional heavy showers, accompanied by thunder.
June, ...	$73\frac{5}{30}$	$74\frac{2}{30}\frac{8}{}$	$76\frac{5}{30}$	$74\frac{2}{30}\frac{0}{}$	$76\frac{5}{30}$	$85\frac{5}{30}$	$82\frac{1}{30}\frac{4}{}$	$71\frac{2}{31}\frac{0}{}$	Fine weather, with occasional showers, till towards the latter end of the month; weather then cloudy, with heavy rain and thunder.
July, ...	0	0	0	0	$76\frac{1}{31}\frac{6}{}$	$86\frac{8}{31}$	$82\frac{1}{31}\frac{3}{}$	$72\frac{2}{31}\frac{1}{}$	Rainy weather, with occasional sunshine.
August, ...	0	0	0	0	$73\frac{2}{31}\frac{7}{}$	$82\frac{1}{31}\frac{7}{}$	$79\frac{5}{31}$	$71\frac{2}{31}\frac{0}{}$	Rainy weather; mornings foggy, towards the latter end; on the 4th, a shock of an earthquake.

State of the Thermometer at Nipâl for the year 1825.

Months.	Inside the house. A. M. 8	A. M. 12	P. M. 4	P. M. 10	Outside in the shade. A. M. 8	A. M. 12	P. M. 4	P. M. 10	Remarks.
September, ...	$70\frac{3}{30}$	$75\frac{10}{30}$	$76\frac{11}{30}$	75	$70\frac{22}{30}$	$77\frac{22}{0}$	$80\frac{21}{31}$	$69\frac{17}{31}$	Cloudy weather, with rain and thunder, during the first half of the month; foggy mornings and fine days during the remainder.
October, ...	$67\frac{23}{31}$	$69\frac{30}{31}$	$72\frac{12}{31}$	$69\frac{28}{31}$	$62\frac{29}{31}$	$70\frac{5}{31}$	$71\frac{18}{31}$	$62\frac{20}{31}$	Dense fogs in the mornings till 9. A. M. succeeded by very fine days, with occasional transient showers of rain.
November, ...	0	$62\frac{1}{30}$	$63\frac{24}{30}$	0	0	$59\frac{11}{30}$	$62\frac{28}{30}$	0	Dense fogs every morning; days very fine.
December, ...	0	$56\frac{13}{31}$	$58\frac{6}{31}$	0	0	$54\frac{11}{31}$	$53\frac{19}{31}$	0	Dense fogs every morning; days very fine: sharp frosts in the evenings, during the latter end of the month.

Maximum and Minimum Temperature of each month.	max. A. M. 8	min. A. M. 8	max. P. M. 12	min. P. M. 12	max. P. M. 4	min. P. M. 4	max. P. M. 10	min. P. M. 10	max. A. M. 8	min. A. M. 8	max. A. M. 12	min. A. M. 12	max. P. M. 4	min. P. M. 4	max. P. M. 10	min. P. M. 10
January,.....	53	48	56	50	56	$52\frac{1}{2}$	55	52	47	28	57	44	$60\frac{1}{2}$	47	50	38
February, ...	55	49	$56\frac{1}{2}$	51	$58\frac{1}{2}$	54	57	52	46	32	58	$47\frac{1}{2}$	$65\frac{1}{2}$	48	50	39
March,...	65	48	66	51	73	53	68	52	65	32	82	49	81	54	66	40
April, ...	66	58	68	63	70	66	68	65	71	57	84	72	84	74	68	51
May, ...	73	$65\frac{1}{2}$	74	67	76	69	74	68	81	63	92	71	90	71	72	62
June, ...	76	70	78	72	81	73	78	72	82	67	94	70	97	$72\frac{1}{2}$	78	67
July, ...	,,	,,	,,	,,	,,	,,	,,	,,	84	71	94	82	86	69	78	70
August, ...	,,	,,	,,	,,	,,	,,	,,	,,	80	$68\frac{1}{2}$	92	72	88	72	75	68
September, ...	78	70	78	74	82	74	78	73	$76\frac{3}{4}$	65	83	71	83	71	74	66
October, ...	72	62	75	62	$77\frac{3}{4}$	66	76	66	71	56	76	62	78	65	69	57
November, ...	,,	,,	$67\frac{1}{2}$	58	69	60	,,	,,	,,	,,	65	55	$68\frac{1}{2}$	$58\frac{1}{2}$	,,	,,
December, ...	,,	,,	60	54	62	56	,,	,,	,,	,,	59	52	60	44	,,	,,

document of the kind I was able to procure, but it may serve us as an index of the general temperature of the valley of Nipâl, but within the limits, however, of this central mountainous division, there, is varying with elevation and topical physiognomy, every variety, from that of the plains of India, to that of the higher latitudes of Europe. A few hours' walk will often conduct the traveller from tropical heat to intense cold.

The inhabitants of this tract are of low stature, but of athletic frames, with active and vigorous habits of body, analogous to those of Europeans, and considerably removed from the sedentary apathy of Asiatics in general. In-door and sedentary occupations are very rare amongst them, from their slight proficiency in the manufacturing skill, and in the useful and ornamental arts generally, as well as from their nearly total disrelish of literary pursuits. Agriculture is the great vocation of the mountaineers, among whom there are few herdsmen or shepherds. The Newars, or aboriginal tribe of the great valley, are somewhat taller, though less muscular than the mountaineers. To the former, the arts are principally entrusted, while those of the latter, who are domiciled in the valley form the predominant military force.

The Trans-Himalayan regions, within the limits to which these remarks apply, may be said to be a vast and uniform plain, though broken by some irregu-

lar chains of mountains. The soil is sandy, and deeply impregnated with salt and saltpetre, and incapable of supporting much vegetation, natural or artificial: it is a bare, bleak, dry region, subject to high but steady winds, and both from its vast elevation, and the saline nature of its soil, extremely cold. The distribution of the seasons is here no longer tropical. The climate in point of general salubrity is decidedly good, and of the same general character as that of the higher latitudes of Europe. The inhabitants are remarkable for their athletic form, and muscular power (particularly those who are employed in carrying burdens across the mountains), as much so as the finest races of men in Europe, though they do not reach the European standard in height*. "I know not where in the world, an equal number of men would be met with, so stout, so well proportioned, and so straight; and I do not remember a single instance of deformity in the space through which I have travelled, unless we reckon as such the glandular swelling of the throat." With all these attributes, however, of physical strength, they do not incline to corpulency, which may be accounted for, by the peculiar nature of their aliment. Captain Franklin has not overlooked this fact, when speaking of the Indian warriors employed in the Hudson's Bay Company, who are fed wholly on buffalo beef, and musk ox, and drink nothing but water, as he observes, that these men, though they

* Turner's Embassy, p. 84.

may be regarded as the models of athletic structure, are never known to grow fat. Among the Tibetans, sedentary occupations are rather more common, than in the mountainous region last mentioned, not so much so from their superior attainments in art or science (though in this respect, what with their obligations to China and to India, they are on a par, at least, with the mountaineers) as from the greater prevalence of superstition and monachism, agriculture is less practised than the tending of cattle.

The further we proceed in investigating the causes of Bronchocele, the more does the subject seem to be opposed to inexplicable difficulties. It is obvious, that to whichever of these doctrines we attach overselves, we fail to attain the desired end of unfolding the secret of the proximate cause. It is scarcely necessary to observe, after what has been said, that within the limits laid down, is to be found every variety of physical circumstance affecting the human race. Extreme heat, extreme cold ; the mean of these. The steadiest of temperatures and the most suddenly and violently variable. Extreme dryness, and extreme humidity, though with reference to the whole space contemplated (exclusive of Tibet) a more than ordinary tendency to the latter. Nor are the circumstances of the people less remarkably diversified in respect to food. Yet, over the whole of this space is Bronchocele abundantly found, not less so, amongst the scattered inhabitants on the crests and sides of mountains of every variety of ele-

vation, as far nearly as the point of perpetual congelation, than amongst the inhabitants of the sheltered levels and the plains.

With such facts as these, the reader will readily perceive the utter futility of the opinion, that any *one* state of climate can be assigned as the universal cause of the disease: there are, nevertheless, one or two circumstances which may be adduced in support of this theory in a general sense, which are deserving of notice.

It is a notorious fact, that the higher and middle classes are less subject to Bronchocele than the poorer, and furthermore, it may be stated, that such of the labouring classes as follow their vocation within doors are less frequently attacked, than the agricultural labourers, and those who in virtue of their employment, are exposed to the numerous varieties of the atmosphere. To these may be added the generally admitted fact, that the disease is found to be less prevalent in large towns and cities, than in villages, or the detached suburbs in their immediate or remoter vicinities.

Were I disposed to indulge in any speculation on this intricate subject, I should, in the absence of more substantial evidence, be influenced in my decision by the arguments deducible from these facts: for they, at least, tend to show, that the more the neck

is subject to exposure in the open air*, the more frequently is the disease found; no mean evidence in support of the opinion, that Bronchocele is influenced by atmospherical causes in a *general* sense. Yet, it would seem, that something more is required to render the opinion conclusive, for, on the other hand, it may be doubted whether climate takes any part in producing this unsightly malady; for the facts I have stated, show, that it appears under all states and conditions of the atmosphere, and every variety of climate; however, though we may be unable to assert, that one or all of these states are necessary agents to its causation, still we cannot overlook the probability of *locality* being an exciting cause, for the following additional reasons: First, because the disease is found to be prevalent amongst foreigners who reside in Nipâl, as, for instance the sepaihies and servants of the Residency. This is particularly the case with the former. I was informed by the officer commanding the escort, that the average ratio for several years past has not been less than 15 or 20 per cent., yet these men are born and bred in various parts of the plains of India where the disease is not known.

Secondly. It is the concurrent testimony of all observers, that when the disease attacks individuals who are strangers in the land, where it is prevalent, that change of locality is the most likely means of

* The natives of the East have always the neck uncovered.

effecting its riddance. In India, this fact has already been noticed by Dr. Evans, amongst the European children in the Tirhoot district, who when the subjects of Bronchocele were uniformly cured, by a removal to some distant part, where it was known that the disease did not prevail.

Thirdly. Bronchocele is always more prevalent in mountainous districts, or their neighbourhood, than elsewhere.

From the above may be collected the fact that Bronchocele very frequently occurs as an ingenerated affection, for it cannot be supposed, that amongst the individuals just mentioned, the disease is influenced by any hereditary taint. It is easy to believe, that certain states or peculiarities of the constitution more readily favour its development than others, and it is very probable, that the one best suited for this is a scrofulous diathesis, since we find that females debilitated by growth, of flaccid fibres, fair complexions, light hair, or, indeed, such other appearances as indicate a tendency to scrofula, are noticed in Europe as persons most liable to become the subjects of Bronchocele.

There can, however, be little doubt that these two diseases are essentially independent of each other, for within my limits, Bronchocele is found to arise under all states of constitution; amongst a people whose habits, manners, and appearance are diame-

trically opposed to each other. Thus the inhabitants of North Bahar, considered as Indians, are a fine and healthy race, and remarkable for cleanliness, yet are they subject to many evil diseases which are common to most parts of Hindoostan: diseases which may be attributed to debility, operating by a specific influence on the circulation, as Leprosies of the most inveterate kind, Elephantiasis, cutaneous eruptions, and glandular enlargements.

The inhabitants of Tibet, on the other hand, despite of the vast elevation of this region* are not (so far as my inquiries are concerned) subject to such diseases, though the course and disgusting nature of their habits, and their almost total neglect of ablution, are sufficient, it may be presumed, to engender a predisposition for these disorders were such possible. Even the inhabitants of the great valley of Nipâl are remarkably free from diseases, of the skin, though they are more neglectful of their persons, and subject themselves to greater excesses than those of the plains.

So far as my own observation went, I can confidently affirm, that the aborigines (Newars) are not prone to glandular affections.

Gonorrhœa, for instance, is a disease of very common occurrence amongst them, and that too of a

* Mountainous countries have been supposed by some to favour the development of Scrofula.

very virulent kind; yet those who are affected by it seldom have occasion to relinquish their ordinary vocations, and though from neglect they will allow the morbid matter to collect, and remain clogged to the penis and scrotum, till these parts become studded with irritable ulcers, in no one instance that fell under my inspection, were the inguinal glands sympathetically affected. Neither Leprosy nor Elephantiasis are to be seen in Nipâl, except occasionally amongst natives of the plains, more particularly the wretched objects, who take up their residence from time to time in the valleys, whose religious superstitions induce them to adopt a life of beggary.

"Strangely visited people,
All swollen and ulcerous, pitiful to the eye,
The mere despair of surgery."

Shak.'s Macbeth.

Some have endeavoured to account for the prevalence of Bronchocele by asserting, that it is an hereditary disease. It is somewhat difficult to determine what the medical signification of the word hereditary is, since of late years, many diseases have fallen under this title, which, according to the literal acceptation of the word, could lay but a small claim to inheritance; but presuming that its usual acceptation is in a modified sense, it is even, still questionable, with what propriety Bronchocele could be added to the list of such diseases. Endemic diseases are for the most part of too common occurrence to trace the fact with accuracy. It is true that we find Bron-

chocele propagated from the mother to her children, and so on, tenaciously adhering to future lineages with astonishing regularity, but we cannot infer, from this alone, that this disease is hereditary. It is first necessary to satisfy ourselves, that the disease is in no way connected with locality, for the children are born under the same circumstances as their parents, and the constitution of the one may so closely resemble that of the other, as to render them liable to the same diseases. Hereditary diseases, such as Gout, Madness, and Consumption, may all in turn have occurred as primary affections, and it is said, that Scrofula has extended itself to animals, the monkey and lion tribe having fallen under this disease, during the severe winters in England*. Such examples, however, it must be admitted, are of rare occurrence, as upon the whole, it may be safely stated, that in ninety-nine cases in a hundred, these diseases can be clearly traced to that notable constitutional taint, which persons so affected have inherited from their ancestors. In such instances, change of locality, though it may sometimes check, it will not annihilate the predisposition to these maladies, for the children of parents, so circumstanced, will always be liable to them, though they may reside in another quarter of the globe. The case is very different with Bronchocele. If persons thus affected remove to a district where the disease is not known, the mere change of situation will, in most instances, relieve, if not remove, the

* Sir E. Home's Treatise on Tumours.

disorder, more particularly during the incipient stage; but should it fail to do this, the benefits arising from change of situation are not wholly lost, since in the great majority of cases the constitutional taint will become eradicated, and so render the progeny free. Again, if foreigners take up their residence in a district where Bronchocele is prevalent, however free they may be from all hereditary taint, and although the disease may be unknown in their native land-still are such individuals liable to become affected, in which cases, it is reasonable to infer, that it occurs as an ingenerated affection.

It is scarcely necessary to remark, that the arguments deducible from the foregoing particulars, all tend to prove, that like Scrofula, Bronchocele has its predisposing cause or causes. Additional examples may be cited to warrant this conclusion, not the least striking of which is the fact that hundreds escape, who are daily exposed to almost every physical circumstance, which could be supposed to favour its development, while at the same time, it may be observed, that the inmates of the palace, men, whose pleasure it is to revel in the delights of every species of oriental luxury, are not altogether exempt from it.

It is not easy to determine what the nature of this predisposition is, all the information we have gained on this point being, that change of locality is the only means of resisting its influence: a means over which we have but little control as applied to the

numberless poor who have not wherewith to gain a livelihood, save from the produce of their native soil. Convinced as every one must be, that this material obstacle must always exist, in an extended sense, we cannot expect to make much advancement towards exterminating this unsightly disorder; it must not therefore be argued, that its extensive prevalence is a proof how little is known respecting the principles of its treatment.

The circumstances under which Bronchocele arises are various. It may occur in consequence of a local injury. A man who placed himself under my care, with this disease, referred its origin to a blow which he had received two years previous, and other instances are recorded.

It may also arise as a sympathetic affection, in illustration of which, I shall cite a very interesting case which fell under my observation. A native of Bengal, aged 32 years, who resided in Nipâl, applied to me in consequence of his having contracted Gonorrhœa, which was accompanied by a sympathetic Bubo on the right groin, in an advanced state towards suppuration. Prior to this ailment he had always enjoyed good health, and might be pronounced a man of sound constitution; however, when he visited me, he laboured under considerable febrile excitement. The usual remedies were recommended as likely to afford him relief, and after having employed these for four days, he again consulted me,

on which occasion he expressed himself improved in health: the discharge from the urethra had ceased somewhat suddenly the day previous, and the inguinal tumour was ripe for the lancet. There was nothing sufficiently striking in the case to attract my attention to the state of the circulation (which I subsequently had reason to regret) and I permitted him to depart with the accustomed advice in such cases. In six days, he revisited me, meantime the Bubo had burst, and the matter had evacuated itself from an opening sufficiently large to obviate the necessity of mechanical interference: a pretty copious discharge was still oozing from this part, but the general appearance was decidedly favourable. On the same day, he called my attention to an enlargement at the lower part of his neck, which I readily perceived was a pulsating swelling of the whole of the thyroid gland. The patient said he had observed it only the day previous, and asserted that it arose without any pain, and occasioned him no inconvenience. As this was the first instance of the kind I had ever met with or heard of, I determined on allowing it to take its own course, with the intention of watching its progress, directing him, however, to wear a neckcloth. For several days he visited me regularly, during which I was never able to detect any marked excitability of the general circulation, nor did he complain of any symptoms which indicated a disturbance of the natural functions: but the swelling of the neck, though not increased in size, continued to pulsate so forcibly, that its motion

might be seen at a distance of several yards. After this time, (in all seventeen days from the date of his first visit,) he neglected to attend till another ailment brought him back to me after a lapse of six weeks, then complaining of rheumatic pains in some of his joints, a disease to which he had been occasionally subject for some years previous. While I regretted having lost sight of this case, I had the satisfaction to find on his re-appearance, that the swelling in the neck had entirely disappeared. The man was able to give me very little information respecting its decrease, as he said he had taken no notice of it, since the sore in the groin had healed.

Had there been any reason to suppose that the thyroid gland was about to become affected, it is not improbable that the rudiments of the disease might have been detected on the day the Gonorrhœal discharge ceased.

In such cases, as the one just related, as well as in those resulting from accident, we cannot overlook the presence of inflammation in a greater or less degree, for although the disease, in all such cases, cannot strictly be said to advance with increased irritability, it must be admitted, that the symptoms indicate arterial excitement rather than defect of the lymphatic system. In the first part of this essay, I ventured to state my belief, that Bronchocele arising under these circumstances will generally be found to have the pulsatory feel, particularly should it occur

in persons of sound and robust constitutions, and, in former days, when depletive measures were commonly resorted to, to overcome the disease, this variety most readily yielded to such treatment.

Women being liable to Bronchocele after parturition is an additional proof, that determination of blood to the part is often the immediate cause of the disease. Upon the whole, however, I am of opinion that Bronchocele is more frequently ascribable to some defect in the lymphatic system; for when it is accompanied by a strumous diathesis, or appears under a state of body, indicating a want of tone of the living fibre, the symptoms will generally point to debility as its *remote* cause.

Another variety of Bronchocele has been described, which has no connection with the causes which are commonly supposed to give rise to the disease. An interesting account of this species may be found in the Lancet*, extracted from M. Larrey's Clinique Chirurgicale. "Real Bronchocele," says this author, "consists of one or several tumours filled with air, which are occasioned by small herniæ of the mucous membrane lining the trachœa."

It was observed in Egypt, by M. Larrey, in blind persons, who are employed by the priests to chaunt at the tops of the minarets; two cases are given

* Vol. I. No. 341, p. 832.

which occurred in officers, who had been employed a considerable time as military instructors.

I presume that this species of Bronchocele or "Guttural Hernia," is similar to that which has been noticed as occasionally occurring in women during parturition. At this period women have been known to complain of a peculiar sensation about the throat, which has been succeeded by Bronchocele. Dr. Burnes makes mention of this in his work*. In such cases the trachœa or bronchi give way, and through the aperture thus occasioned, the air owing to the inordinate exertion of the patient at this critical period, is forcibly propelled, so that a flatulent swelling presents itself over the neck. There is no difficulty in distinguishing this species, as by compressing the tumour you are enabled to evacuate the air, by which you *reduce the hernia*, and restore the neck to its natural size. It would seem, however, that a permanent cure is very doubtful. In the cases related by M. Larrey, it was found that graduated compresses, with the use of stimulating applications, succeeded so far, as greatly to reduce the size of the tumours, but did not prevent their re-appearance on the least exertion on the part of the patients. There is, however, a case recorded, by Dr. Blundell†, of a woman who had twice laboured under this affection, during the births of two of her children. On both

* See, p. 548.

† Blundell on Midwifery, Section 22nd. Lancet.

occasions the aperture healed spontaneously, without a single bad symptom.

It is reasonable to infer that the laceration does not extend beyond the mucous membrane or emphysema, which does not appear to have been noticed, would in all probability ensue. This variety of Bronchocele, (if it may be so called) I never observed in Nipâl.

PART III.

On the Treatment of Bronchocele.

Bronchocele has been held by some to be a constitutional, by others to be a local, disease, and Iodine, but recently applied to the cure of it, and applied alike by those who maintained the former and the latter doctrine, has naturally had its efficacy questioned, notwithstanding its general high repute.

Before I went to Nipâl I had some acquaintance with the disease, as well as with the use of Iodine to cure it; I therefore commenced my experiments with this medicine as the best accredited remedy, and used it under the impression that Bronchocele was a local disease, which, in the common course of events, produces no sensible effect beyond the part itself. Still, however, I had some doubts upon the latter point, and perhaps on that account, and because such was the practice, I, at first gave the medicine internally

as well as externally. But the more I saw of the disease, the more strongly was I inclined to deem it of a purely local nature, and, at the same time my increasing experience of the medicine gave me constantly fresh reason to think that its internal administration could not always be relied on with safety. In so many instances, indeed, did it occasion not only distressing, but even sometimes alarming, symptoms, that after the first three months, during which, thirty-two cases were treated, I found it expedient to relinquish all further trial of its internal exhibition: the rather and the sooner, perhaps, owing to certain peculiarities of mystification in Nipâl. I was a voluntary practitioner among the poorest classes of the people, who, at whatever distance they might reside from the Residency, were obliged to attend me there. Bronchocele being neither a painful nor disabling disease, and its deformity being a matter of little consideration with such patients, it was sufficiently difficult to procure their attendance for its treatment under any circumstances; and had I therefore, as I frequently must have done, by the internal administration of Iodine, hindered them in the pursuits of their daily labours, I must soon have caused most of them to have absented themselves.

In proceeding to give the general results of my experience in the treatment of Bronchocele at Nipâl, it is my intention to introduce the subject by offering a few remarks on the necessity of keeping the neck constantly covered either by a bandage or

neckcloth, as a very important step towards the cure of this disease.

The propriety of applying some sort of bandage to the neck, has, I believe, never been questioned; indeed, as a general rule it is always adopted, and that this simple remedy is, in some instances, alone sufficient to remove the swelling, is the concurrent testimony of all those, who have had extensive opportunities of treating this disorder: pursuing, therefore, the course recommended by others, from the commencement of my practice, the wearing a neckcloth or bandage was strictly enjoined.

It was not, however, till I had had more extensive opportunities of observing the disease, that my attention was excited to a circumstance demonstrative of the importance of this prescript; and as I am not aware that it has been previously noticed, I shall here beg leave to introduce it.

From what has been mentioned respecting the remarkable structure of the Nipâl mountains, it will readily be believed that carriages are out of the question, and beasts of burden seldom available: in point of fact, the sole means of transporting merchandize, or baggage of any kind, within the mountains, from the snows of the plains, is by men, who fixing, if the shape of their burden permits, a conical basket to the upper part of the back, by means of two shoulder-straps, and a broad band

across the forehead, habitually and easily carry as much as two puckah maunds weight*, over the roadless and precipitous paths, which form the only means of communication. The men so employed, consist chiefly of the Murmi, Goorung, and Kacharian tribes, who dwell on the confines of the great valley, or in the neighbourhood of the commercial routes, thence diverging and converging; and as the carrying of burdens may be said to be their principal vocation, they have received the name of Hill-porters, and in Kathmandù they are ordinarily recognized by the title of Bokears.

From having remarked that very few of these men were the subjects of Bronchocele, my first impression was, that they were less liable to this disease than the rest of the commonality: a closer examination, however, very soon convinced me of my error; for though the swelling very rarely attains a large size, I had no difficulty in satisfying myself that most of them were more or less affected by it.

This difference of size may be accounted for, by the diseased gland remaining beneath the sterno cleido mastoidei muscles, and as it enlarges, it passes laterally outwards and backwards, maintaining its relative position with the muscles by which it is bound anteriorly: instead of, as is ordinarily the case, the diseased growth emerging from beneath the sterno

* Equal to 160 lbs.

mastoid, sterno thyroid, and sterno hyoid muscles, either pushes the sternal edges of these to the side or passes round them, and becomes situated in front between the sterno cleido mastoidei, and platisma myoides.

In lieu therefore of a prominent and irregularly shaped tumour being presented, the only indication of the presence of the disease is simply an enlargement of the lower and lateral parts of the neck, which, in most instances, does not occasion a deformity sufficiently conspicuous, to attract common observation. It may easily be detected by contracting one of the muscles by a slight inclination of the head to either side. The enlarged gland is then pressed upon by the action of the muscle, and in this position, its boundaries can generally be discerned. It may also be distinguished by relaxing both sterno cliedo mastoidei muscles, and passing the finger along their sternal edges. When the middle portion participates in the affection, or is alone the seat of disease, it seldom reaches a large size. A globular tumour, imparting a cartilaginous feel, presents anteriorly, which, so far as my observation went, never exceeded the size of a hen's egg, but usually was much smaller.

Here, again, the tumour meets with a firm resistance from the platisma myoides, which from the nature of the employment of these persons, as well as their peculiar mode of sustaining their burdens, must

render this muscular stratum more powerful than ordinary; for, in their manner of carrying, there is always an immense strain on the neck.

This deviation of the position of the diseased growth is not confined to these hill-porters, as I have met with frequent instances of it amongst men whose occupations are totally different. In women, however, I have never noticed this variety. My attention having been particularly directed to this point, I may venture to assert, that I have seen some hundreds of cases amongst these hill-porters, and in my notes there were but three instances where the tumours were of large size, in all of which the diseased gland rested on the anterior surface of the sterno-cleido mastoidei muscles.

The considerations deducible from the foregoing particulars are of so much practical importance, that I have been induced to enter into a more lengthened detail than might, perhaps, be considered necessary. But to apply them; a better proof could not be afforded of the importance of a moderate degree of pressure and support to the diseased growth, as a powerful auxiliary in the cure of Bronchocele. I will not hazard an opinion as to why in these particular individuals the diseased gland occupies a different position from that which is commonly met with; but I can confidently assert, that when it is situated as I have described it, the tumour will never attain a large size, and the

only way to account for this seems to be, by the unremitting support it receives from the powerful muscles by which it is bound anteriorly, the degree of pressure varying according to their contraction and relaxation, while this change of action, at the same time, keeps up a constant friction over the morbid growth.

As preliminary recommendations, then, in the cure of Bronchocele, *pressure* and *simple friction* should never be neglected. The degree of pressure, however, should always be regulated according to the feelings of the patients, and to accomplish this, it is advisable, that they should apply it themselves, for they will always be careful not to bind the neck too tightly, but with sufficient tenseness, to ensure the necessary degree of support of the diseased part. I can only suppose it to be the abuse of this simple precaution, that has induced some practitioners to abandon it, for if we reflect on the inordinate vascularity of the diseased part, as also that the enlarged arteries and veins are generally subcutaneous, it is easy to believe that undue pressure would check the return of blood to the heart, whereby a train of distressing symptoms might supervene.

Pressure is perhaps not so much the object as support, and a neck-cloth (which I have always found sufficient) offers the additional advantage of guarding the neck against the varied effects of atmosphere.

Pressure and Simple Friction.

In order to try the effects of these remedies alone, six cases were selected.

Bhurrsurie, a native of Bengal, aged 26 years, of sound and vigorous constitution: applied to me on the 6th May, in consequence of a pulsating enlargement of the whole of the thyroid gland, which he had noticed for the first time a month previous. Circumference of the neck, over the broadest part of the tumour, 14½ inches.

Directed to apply a large neck-cloth, and to rub the neck with common lard, for the space of half an hour every night and morning.

May 20th—reduced ½ an inch.

June 2nd—discharged cured, with directions to continue to wear the neckcloth.

Churù, aged 30, a native of the plains; of apparently healthy constitution. Has an enlargement of the middle lobe of the thyroid gland, about the size of an orange. The tumour is firm, and elastic to the touch, and is void of pulsation. Has noticed the disease three months.

The same treatment ordered, as in the preceding case, which was persevered in for one month, after which, little or no trace was left of the disease. This

patient visited me only twice, as he was employed as a dâk runner, and resided in the hills.

The remaning four cases were those of Newars by birth, in which the same plan of treatment did not answer so well; for after a month's trial, a very small reduction only took place in the size of the swellings; subsequently, however, by the application of the iodine ointment, they were successfully treated.

It will be observed, that the two men who were cured by means of pressure and simple friction were natives of the plains, and it may be inferred, that in both instances the disease occurred as a primary affection. Cases, arising under such circumstances, will invariably be found to yield sooner, than those where a constitutional taint may be suspected. They were however selected as the most favourable examples for such treatment, being all incipient cases, and men of healthy habit of body.

Iodine Ointment. In that part of this essay which is devoted to a general description of Bronchocele, it will be borne in mind, that I have divided the disease into three varieties, which plan I have been induced to adopt, in order to show, that the length of time required for a cure very much depends on the character of the disease. As a matter of practical importance, this division is of little value, since the remedies I now proceed to speak of are alike applicable to all stages of the disease without reference to the constitution, or the age of the patient, the size

or the composition of the morbid growth. I have already stated, that after a trial of three months I was constrained, from circumstances hereafter mentioned, to relinquish the internal administration of iodine; from that period, without any deviation, the sum total of remedies employed by me, consisted of iodine ointment, keeping the neck constantly covered, and simple friction, over the diseased growth, with common lard.

The ointment, as I first used it, was composed of two scruples of iodine, to an ounce of simple ointment, well blended together, but subsequently the quantity of iodine was increased, to double that amount.

As the number of cases treated amounts to 116, from which the following are selected, I have chosen only such as deserve to be recorded as offering some varieties, either as to the nature of the disease, the date of its exsistence, or the ages of the patients.

Pulsating variety.

Bheemsen, Parbutteah, aged 12 years; An overgrown, thin boy, but healthy.

Has a pulsating enlargement of both lateral lobes of one year standing; circumference of the neck over the broadest part of the swelling $11\frac{5}{8}$ inches. Applied May 13th. Directed to envelope the neck in a large neck-cloth, to rub on the iodine ointment for the

space of half an hour every morning, and to use simple friction at night *ad libitum*.

May 26th—discharged perfectly cured. Ordered to continue wearing the neck-cloth. Measure of the neck $10\frac{1}{2}$ inches.

Buddha Lakshmi, Newar, aged 27, a woman, of robust and vigorous constitution: has a large pulsating swelling of the middle lobe, occupying the front and lower part of the neck, and projecting forwards beyond the chin. Has had the disease seven years. Circumference of the neck $17\frac{1}{2}$ inches. Applied for treatment June 1st. Ordered the same treatment as in the preceding case.

June 14th—ointment remitted for four days, in consequence of the skin covering the tumour, being excoriated. July 19th discharged cured. Directed to keep the neck covered. Measurement of neck $14\frac{3}{4}$ inches.

Kumnie Sing, Parbutteah; aged 21 years, an athletic man, of sound constitution: has a pulsating enlargment of the whole gland. The lateral lobes situated beneath the sterno-cleido mastoidei muscles: the middle portion about the size of a hen's egg, presenting anteriorly. Date of disease not known, but supposed to be recent. Circumference of neek $16\frac{2}{8}$ inches. Applied May 22nd. The same treatment in the preceding case.

June 4th—skin of the neck excoriated. Ointment remitted for three days. Swelling reduced $\frac{1}{2}$ an inch.

June 27th—no trace left of enlargement of the middle lobe: but slight reduction of the lateral lobes. From this date he neglected to attend.

The Lympahatic variety.

Surface of tumour, smooth, firm, and elastic; void of pulsation ; skin natural ; more commonly met with in men than women ; very common in animals ; seldom attains a large size, unless complicated with the cellular variety.

Dewar Das, Parbutteah, aged 21 years ; a lad of sound and healthy constitution, inclining to corpulency. Applied May 14th. Has a prominent swelling of the middle lobe, about the size and shape of a large orange : lateral lobes slightly enlarged, lying beneath the sterno-cleido-mastoidei muscles. Disease of seven years standing. Circumference of the neck $15\frac{3}{8}$ inches.

Treatment the same as the preceeding. May 31st —circumference of neck decreased one inch. Ointment remitted for three days, in consequence of the surface of the tumour being excoriated.

June 21st—circumference less by $1\frac{3}{4}$ inches.

July 8th—discharged cured. Ordered to continue wearing the neck-cloth. Measurement of the neck $13\frac{1}{4}$ inches.

Rhumah Dèvi, Parbutteah ; aged 30 years ; a woman of sound constitution, of fair complexion. Has never borne children. An excellent specimen of disease of both lateral lobes : showing the difference of size as dependant on their relative position to the sterno-cleido-mastoidei muscles. The right lobe passing in front of the muscle, projects directly forwards and outwards, and has attained a considerable size. The left lateral lobe is also enlarged, but being situated beneath the muscle, occasions only a regular and gradual enlargement in the lower and lateral part of the neck on that side, the middle portion is altogether free from disease. The disease was first noticed about ten years previous. Applied June 14th. Circumference of the neck $14\frac{3}{4}$ inches. By the application of the usual remedies, the enlarged right lobe was reduced to its natural size in ten days. She continued under treatment till August 21st, when scarcely any enlargement was perceptible on the left side of the neck. Measurement of the neck $12\frac{5}{8}$ inches.

This patient evinced an unusual anxiety to get rid of the disease. She was in the habit of rubbing the tumours every night, with lard, for upwards of an hour. During the time she was under treatment, the cuticle in several spots was destroyed, but she

nevertheless, persisted in the application of the ointment.

Cellular variety. Women much more subject to it than men. Generally connected with some defect of the constitution, as debility, over-growth, and general torpor of the system. Shape of the tumour irregular; surface lobulated. Some parts soft and flabby, while in others it may be firm and elastic; skin loose; superficial veins enlarged and varicose; usually attains a large size.

Doughar, Parbutteah, aged 7 years; a girl of delicate habit of body, and of fair complexion. Applied March 14th. Has enlargement of the left lateral lobe, which she first noticed two years previous. Circumference of the neck $9\frac{7}{8}$ inches. The same treatment as the preceding.

April 24th—skin covering the swelling excoriated. Ointment remitted for four days. No diminution of the tumours.

May 18th—reduced half an inch: several spots of cuticle destroyed. Ointment again remitted for six days.

July 21st—discharged cured. Measurement of the neck nine inches.

Ali Buksh, Bengalee, $2\frac{1}{2}$ years of age; a delicate child, bearing strong marks of general debility:

has apparently diseased mesenteric glands—has also a cutaneous eruption on either ham. Applied May 2nd, with enlargement of the whole thyroid gland. The parents neglected to bring the child regularly, but she continued under treatment for two months; at the expiration of which time no decrease in the swelling was perceptible, nor did the general condition of her health improve, under the administration of mild alteratives. Neglected to attend after July 4th.

Lushmah, Parbutteah, aged 26 years; a woman to all appearance healthy. Applied April 8th. A good specimen of cellular enlargement of the whole gland, of three years standing.

Some of the cells very prominent, and apparently as large as pigeons' eggs. Circumference of neck 14 inches. Treatment the same as the preceding. This patient attended so rigidly to the directions given her, that she succeeded in destroying the cutical covering nearly the whole surface of the morbid growth. In consequence of this, she suffered considerable pain, and it became necessary to apply poultices, and subsequently simple dressings, for fifteen days, before she was able to repeat the application of the iodine ointment. On the 30th of May, the circumference of the neck was reduced two inches—and on July 16th, she was discharged perfectly cured.

This patient, a Fakirnèe, found it to her advantage to attend regularly during the time she was under treatment. It was not, till the cuticle had been destroyed, that the tumours began to decrease, and then its reduction was very rapid. It is remarkable, that the continued application of the iodine ointment in this case, not only effected the entire riddance of the disease, but the neck itself after all remedies had been suspended, became so unnaturally small and shrivelled, as to warrant the belief that the subcutaneous adipose stratum was also absorbed.

Complicated tumours. Several cases of this nature were treated, and some of large size and long standing were successfully reduced.

Those patients, who were regular in their attendance, were for the most part cured. One decided instance only, to the contrary, occurred; this happened in an old man, who had enlargement of the whole gland for upwards of 30 years. It had not increased in size for many years. When he applied to me, the tumour was of regular shape, and occupied the front and lower part of the neck. It projected forwards beyond the chin, and was, in this situation, firmly bound by the surrounding integuments, which latter were natural in appearance. The tumour was very firm and elastic, and felt like a mass of cartilage. As this man was a Fakir, I was enabled to ensure his regular attendance, since he did not scruple to accept alms, as often as they might

be offered. For eight months, this patient strenuously persevered in the use of the remedies recommended; at the expiration of which time, little or no reduction had taken place in the size of the tumour. I lost sight of this man shortly afterwards, and was never able to learn whether any decrease in the swelling had subsequently taken place.

Three other cases occurred in the course of my practice, in which the success of the remedies might be said to be doubtful. These were in elderly persons, where the disease was of very long standing. They were under treatment for three or four months, without deriving any apparent advantage; after this, they seemed to lose all confidence in the remedies, and neglected to attend me.

With these four exceptions, all those patients, who were not cured, were more or less relieved; and I saw none, in which a fair prospect of cure might not be anticipated, had they paid the required attention to the directions given them.

Tincture of Iodine. As the agency which iodine exerts over the system, whether used externally or internally, at present forms a subject of inquiry, it is foreign to my design to enter into any speculations as to the *modus operandi* of this medicine. My chief object is to offer a brief statement of what has occurred in my own practice, and I am content to commit the considerations deducible therefrom, to the

reflection and experience of those, who have devoted much of their time and talents to this particular subject.

The tincture as used by me consisted of 10 grains of iodine to an ounce of spirit. The dose varied from 15 to 30 drops.

The first patient, who placed himself under my treatment in Nipâl, was a pensioner of the Resident's, a delicate and emaciated lad, about 18 years old. Was perfectly blind, and he showed may signs of a weakened intellect. Applied April 15th, with a pulsating enlargement of the whole gland, of two years' standing. Circumference of the neck $14\frac{1}{2}$ inches. Ordered to take Tinct. Iodine gtt. 20: to rub on the iodine ointment and cover the neck with a bandage.

April 16th.—Great excitement of the vascular system—palpitation of the heart—total disinclination for food—tremor of the lower extremities—tongue moist and white. The tincture and ointment suspended. Ordered to take Ol. Ricini ℥i.

April 17th.—General abatement of the symptoms—complains, however, of great debility and lassitude, and has no inclination for food. Bowels freely open. No medicine given.

April 18th.—Feels tolerably well, and has been able to eat some breakfast with relish. Iodine Ointment rubbed over the swelling for 20 minutes.

April 19th.—General health continues better: an extraordinary diminution in the size of the swelling has taken place.

April 21st.—Discharged perfectly cured. Circumference of the neck $12\frac{1}{8}$ inches.

This case may serve to exemplify that derangement of the whole system, which the Tincture of Iodine occasions, in such constitutions, as from the occurrence of these symptoms, the medicine is reasonably assumed, totally to disagree with; and in several cases which fell under my observation, the derangement did not stop at the point here noticed, but progressed to an extent, which placed the lives of the patients in jeopardy. A few days sufficing, in such event, to superinduce diarrhœa, difficult respiration, cold sweats, (with all their exhausting effects,) upon the symptoms of serious disturbance, set down in the case before us.

But it may, perhaps, be argued, that the delicate constitution, and emaciated frame of the patient, whose case is cited, rendered him an unfit subject for the Tincture of Iodine: an objection which is fully answered, by observing, that the peculiar influence of iodine upon this poor boy is no other than it is apt to produce upon many persons of sound and healthy constitution, and of mature years: whilst (such is the inexplicable idiosyncracy militating against the substance), many others of feeble frame, and

tender years are yet, no ways sufferers in their general bodily health, even, though they may have taken the Tincture of Iodine daily for two months and even longer.

Both these are points which my experience of the medicine has served to demonstrate over and over again, and what is strange, I have noticed that children, prior to the age of adolescence, having some indications of general torpor of the system or debility, are peculiarly insensible to iodine, in either form. Bronchocele arising under such peculiarities of temperament will almost invariably assume the cellular variety, and though in children it is rarely seen of large size, it is nevertheless, by far the most difficult to reduce. There is usually a partial yielding of the tumours, in the space of a few days after the employment of iodine, whether internally administered or topically applied; after this, the absorbent powers of this medicine seems checked, as the patients will continue the daily use of the Tincture and Ointment (the former as much as from 30 to 35 drops for a dose), without its producing the least sensible effect on their constitutions, or assuming any controul whatever over the disease, till by perseverence in the plan, a fresh action seems established, which takes place at very irregular periods, varying from a fortnight to two months, after which a speedy reduction of the morbid growth usually ensues. If, however, the disease happens to be of the pulsating variety, the application of the iodine ointment will seldom

fail to remove it in a few days, but this form of the disease is seldom seen before the age of puberty.

But the case of the blind boy has some further interest and importance attached to it, in consequence of the following peculiarities belonging to it.

1. The development of the symptoms, noticed after a few hours, from a single dose of the Tincture.

2. The decided effect of a single purgative in removing them.

3. The disappearance of the Goître in six days, on two out of which the remedies were suspended.

Though I have ever found that the pulsating variety will yield to the treatment recommended, far sooner than any other form of the disease, still this is the only instance I met with where the effect was so decided as to remove the morbid growth in six days, more particularly as it could not be considered of an incipient nature. Again, the rapid succession of the symptoms believed to be produced by a single dose of the Tincture does not in the least correspond with the general results of my experience in Iodine.

If we could always ensure so early a warning, that the Tincture of Iodine would disagree with a patient, its value would be materially enhanced, as we could, in such event, avert its deliterious effects, ere the general health becomes implicated. The reverse of

this, however, generally takes place, for the effects of this medicine, whether for good or harm, lurk in the system for a considerable time, and even sometimes long after its discontinuance, ere we are apprized, by any signs whatever of its agency, and then suddenly are apt to break out the symptoms I have described, not more to the prejudice of the patient's health, than to the difficulty which then accrues, in our attempts to effect their speedy removal. The same uncertainty in the agency of the tincture of iodine is also apparent, amongst those patients with whom it may be supposed to agree. A fortnight or three weeks usually elapses before any reduction of the diseased growth is noticeable, after which time it may begin to decrease rapidly, or it may require a perseverence in the remedies for many weeks, and even months, to accomplish a cure. Some cases, indeed, which I have met with, were so obstinate in their nature, as to resist a strenuous and prolonged persistence in the Tincture, in combination with the other remedies, so that the patients having lost all confidence in the treatment, and abandoning all hope of obtaining any relief, they have been induced to withdraw their attendance. Notwithstanding, however, this discontinuance of all remedies, the effects of the Tincture have yet to show themselves, and I believe they will seldom fail to do so, sooner or later. When these do appear, the quantity they have already taken is sometimes sufficient to remove the disease without the necessity of repeating the remedies.

A very interesting case, illustrative of this, may be seen in the Lancet*. And the following examples have occurred in the course of my own practice.

Gunga Laksmi, a stout, healthy female, native of the hills, about 30 years of age; applied in consequence of having a large Goître, occupying the whole lower and front part of the neck. Has several children, none of whom have the disease.

The tumour was pendulous; of irregular shape; here and there lobulated, in some parts soft, in others as firm as cartilage. She had had the disease for 15 years, and for the last 10 years, she had not remarked any alteration in its size. When this patient first visited me, she had reached the seventh month of pregnancy.

For the first month, she was treated by the Tincture of Iodine, in quantities varying from 15 to 25 drops for a dose, daily, and used simple friction with common lard over the swelling, as much as she was able in the course of the day. After this, it was found necessary to omit the Tincture, and the daily application of the Iodine Ointment was substituted. This last, she continued to use regularly for a fortnight, when she absented herself, and I saw nothing more of her for seven weeks. No apparent benefit was derived from the remedies previous to her relinquish-

* No. 304, vol. ii. 1828 and 29.

ing her attendance on me. On her return (with a fine infant in her arms), a general softening of the diseased growth had taken place, and it had decreased to nearly one half its former size. By way of experiment, all remedies were suspended, except that of keeping the neck covered, with a bandage, and in about six weeks afterwards, the only trace remaining of the disease was a hard lump, which felt like cartilage, situated on the lower part, and right side of the trachæa, about the size of a hen's egg. As this remnant remained stationary after a time, the ointment was again had recourse to, and though its use was steadily persevered in for two months, it failed to decrease it. The principal deformity left, however, was the exceeding looseness and flabbiness of the skin of the neck.

It is said, that persons predisposed to Bronchocele are particularly liable to it after parturition. There is, doubtless, good reason why such should be the case, though the example just given (the only instance of the kind which fell under my observation) forms an exception.

Several of the sepaihees belonging to the Resident's escort were attacked with Bronchocele about the same time, and being one and all very desirous to get rid of the disorder, they commenced rubbing in the ointment, apparently with the full determination of giving the medicine a fair trial. As it happened, none of them obtained relief so soon as they antici-

pated, and after they had applied it for about a fortnight, they preferred leaving the cure to chance, to placing any further reliance on the remedies. A month had not elapsed before they found that the swelling of their necks began to decrease, and upon my proposing that they should give the ointment another trial, the answer I received was to the following effect: *That the remedies did them more harm than good, for since they had relinquished their use, the disease had gradually been on the decrease.*

Among the serious consequences which have been observed to result in certain instances, from the continued use of the Tincture of Iodine, are the diminution of the healthy glandular tissues. The ladies of Switzerland, who are affected with Bronchocele*, it is said, decline taking the tincture under the impression that it causes a diminution in their breasts: yet what is, perhaps, more important in men, is a sudden reduction of the testes, from the same cause.

It is reasonable to suppose, that such effects would most commonly arise, as a sequel to the symptoms, already noticed with reference to the blind boy's case, such, indeed, would seem to be the opinion of Dr. Jaun, who has lately published some valuable remarks on the agency that iodine exerts over the system.

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* See Lawrence's Lectures on Surgery, article Bronchocele.

But that reduction of the testes may take place as the primary visible agency of this medicine, the following case will shew.

Bishnumah, by birth a Newar, 35 years of age; a tall, stout, healthy looking man, of fair complexion. Has a large cellular Goître, occupying the whole lower part and front of the neck. The general shape of the tumour is spherical, and on its surface are several prominences, denoting the presence of large cells beneath; the whole growth is unusually firm, and elastic to the touch. Has had the disease twenty years. Applied May 2nd. Circumference of the neck $18\frac{3}{4}$ inches.

This patient was ordered to take 25 drops of the tincture daily, and to rub on the Iodine Ointment. This he continued to use for two months, and the tumour had gradually decreased, about one-third of its original size. At this time (though I was unable to detect any disturbance of his general health), he complained of partial loss of appetite, and of sudden flushes of heat, more particularly about the head and face; he also said he felt a general unfitness for his ordinary work (that of a mechanic). I thought it prudent, in consequence of these, to suspend the remedies till the symptoms he complained of might subside, and in lieu of them, he was directed to take a dose of castor oil every second morning, with the intention of keeping his bowels clear.

He visited me again in about a fortnight, on which occasion, he informed me, that the sensations he had previously complained of had by no means abated; but that in addition to these, a new source of anxiety had arisen, in consequence of his sexual passions having become so dormant, that coition, and scarcely an erection (to both of which he had been previously much subject) had not been observed for more than a month previous.

These symptoms were to be accounted for, by his testes, having become reduced to about one-third their natural size. As soon as I discovered this latter, I placed my whole reliance in saline aperients, to purge the blood of that impurity which I was led to suppose it had acquired, from the continued use of the Tincture of Iodine. These succeeded so far, that in a month afterwards, August 20th, the testes began to increase in size, and the patient had experienced other sensations, which indicated that the defect of the generative functions was partially repaired. After this time, much to my regret, he absented himself, and I was never able to collect any further information respecting his case.

The general results of my practice in Bronchocele may be stated in a few words. The total number of cases treated amounts to 116, (this number includes several of the sepaihees, who were indebted to my friend Captain Robinson, Commandant of the

escort, for their cure, by the judicious employment of the remedies from my recommendation.)

Of these 57 were discharged cured, and in such a manner as to leave no trace of its existence. Fourteen absented themselves, in whom the disease had nearly disappeared. Thirty-four derived considerable benefit from the remedies, and would in all probability have been cured, or nearly so, had they been regular in their attendance, and given the medicines a longer trial. Six obtained only partial relief, after a trial of two months; and five were wholly unsuccessful, but these occurred chiefly in middle-aged persons, in whom the disease was of long standing, in which, it is probable, the morbid growth had undergone some organic change.

The only condition which I imposed on my patients was that of paying me a *daily* visit, during the time they were under treatment; to ensure this, I never trusted a particle of the ointment or of the tincture out of my sight. This precaution was especially necessary for those who were treated with the tincture. I was also particular to see that the ointment was applied in my own presence, that I might satisfy myself, its application was in no way abused. This will account for the patients' using the ointment but once in the course of the day, for there is no reason why it should not be used twice, and even oftener, with equal safety. I was also

careful that the ointment was made fresh every second day to prevent its undergoing, by age, any chemical change.

The natives of Nipâl, as far as I could learn, do not profess to cure the disorder. It would seem, however, from the following passage, that in some parts at the foot of the Himalayan range, a cure may be obtained, and that even extirpation has been practised. "We understood, that it was sometimes cured when early means were taken, and these are said to consist in extirpation of the part by the knife. We saw some persons who had the scars on their throats resulting from this mode of cure, which had, in these instances, been completely successful*."

Calcutta, 1*st Nov.* 1832.

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* Fraser's Journal of a Tour to the Himalayan, p. 349.

ON

THE EFFICACY OF VACCINATION

IN

INDIA.

By H. S. MERCER, Esq.

Presented 2nd June, 1832.

Invaluable as the Jennerian discovery has been to mankind, as a prophylactic against small-pox, ample experience in every quarter of the globe has proved that the antidote is not always a certain one. This will be less a subject of surprise, when we reflect, that inoculation with the small-pox virus itself has not invariably afforded security against subsequent attacks of that disease; even in its most dangerous form. We ought therefore to rest satisfied with the knowledge we possess, that by the introduction of vaccination, the human race has been incalculably benefitted; nay, that it would have been, had vaccination possessed no other power than that which we know it to have, of mitigating in almost every instance the severity of the disease, for the prevention of which it is practised.

There are exceptions to all general rules, and though it was formerly supposed, that certain eruptive diseases of a febrile nature, such as measles, scarlet fever, and chicken-pox occur but once in life, we have reason to believe, that the rule does not uniformly hold good, for we know that a second seizure of the natural small-pox has occasionally proved fatal; and accordingly, we may be less surprised if vaccination has failed to afford perfect immunity in every instance against subsequent attacks of the variolous disease. It is unquestionable, however, that small-pox supervening on vaccination in 99 cases in the 100 assumes a form of the disease of a mild and modified character, and very rarely of such a nature as to prove destructive.

My reason for directing the attention of the Society to the subject at present is, the hope I entertain, that as this is the period of the year at which the variolous contagion is most generally and extensively prevalent throughout the greater part of India, some opportunities may occur to the resident members, and others, to elucidate in a more satisfactory manner, than has hitherto been done, the efficacy of the cow-pox inoculation in this country; a practice which has now been introduced for a period of twenty-nine years.

That the small-pox does at the present time prevail to a very considerable extent in Calcutta, I judge not only from the cases that have occurred to

myself, but from many more that have been brought to my knowledge; many of them of a suspicious character; and some notice of which may be of interest to the Society, in so far, as it will tend to shew, that the vaccine virus occasionally loses its power of entirely protecting the constitution against the variolous contagion. It is worthy of remark, that the disease has in a more than usual proportion attacked individuals advanced in years, many of whom there is reason to believe had undergone the operation of vaccination; and that among those no small number of deaths has taken place, not only of the native population, but also among the European portion of the community.

Before entering on the consideration of the varioloid disease, it may not be irrelevant to notice the more than usual prevalence of other eruptive disorders at the present time in Calcutta, viz. the chicken-pox and measles, particularly the former, which for some time was, and still is, so apt to be confounded with the varioloid disease, that I may be excused for entering on their diagnostic features.

In Varicella, the fever which precedes the eruption is usually but slight, it continues only for two or three days, although sometimes for a longer period, according to the successive crops of the eruption; the eruption is not attended by any erysipelatous efflorescence of the skin; it generally first appears about the breast and shoulders, then on the face and

extremities, and often in crops for three or four days; it appears in inflamed spots, of a pale red colour, which are flat, and of an oblong figure; the papulæ become vesicular from the first day; they disappear upon pressure or distention; between them there is but little inflammation; the fluid of the vesicles is transparent, and afterwards it becomes of a yellowish hue; the vesicles by degrees increase in size; their coverings are extremely thin; they are soft and yielding to the touch, and are not very painful. By the fourth day, the vesicle covers the top of the pimple; they are situated in the cellular tissue, between the true skin and cuticle; they are composed of a single cavity, and they seldom exhibit any depression in their centre; they are at this stage of various appearances, some are only small inflamed papulæ, others are fully formed, and some are puckered or crusted, according to the particular stage of their progress; they begin to desiccate on the third or fourth day, or as early as the second, and this is usually completed by the eighth day. The scabs fall off in fragments of different forms and sizes, and the redness left in the skin, after desquamation, is slight, and soon disappears; salivation never occurs; there is no secondary fever, no bloody urine, and it never proves fatal of itself. The marks left in the skin by varicella are of a small size, regular in figure, and have smooth surfaces.

In the varioloid disease, the fever which precedes the eruption is in general slight, though in some

cases severe, and it continues for three or four days; the constitutional derangement is also in most cases slight; the eruption commonly appears all at once, first on the face, but sometimes on the hands and legs, and it is at times accompanied by swelling and redness of the face, and sometimes of other parts of the body; it is papular in its origin, hard, circular, and painful to the touch: the pimples are formed in the substance of the true skin, and feel on pressure like small shot; they become larger and redder by degrees; they are most prominent in the centre, and their circumference is of a light red colour. On the second day of the eruption, many of the pimples have small vesicles at top of a pearly colour, encircled by irregularly formed areolæ; they become more raised and distinct, have rounded summits, and hard inflamed bases. By the fourth or fifth day, or even on the third, many have acquired their full dimensions; some present depressions in their centre, and some begin to desiccate, and the fluid in those that have attained their full size becomes opaque, or sero-purulent; desiccation is well advanced by the sixth day, and the circumference of the pocks is of a deeper red colour. In the varioloid disease numbers of the pimples never come to suppuration; many die away in their inflammatory state, and from their vesicular state, pass to incrustation at once, especially on the extremities, and they here assume a dark appearance, and are hard to the touch. The progress to incrustation is not always uniform, nor in the same case is their period of falling off the same. In some cases,

the crust appears as early as the fifth day, or not until the seventh or eighth, or a later period; in others, on some parts of the body, they begin to dry and fall off by the ninth or tenth day, whilst on other parts they do not fall off until a much later period. After they have fallen off, tubercular elevations of the skin of a red colour, particularly on the face, usually occupy the spots where they were situated, which often remain for a long while visible, and sometimes they are succeeded by a growth of new crusts. They seldom leave marks, or pits in the skin; but when they do, they are small in size, and of a circular form.

Although the above are the usual distinguishing characters of varicella, and the varioloid disease, yet in their rise, progress, and decline the symptoms frequently assume a variety of aspects.

With the view however of rendering the general characteristics of the varioloid disease as it has occurred to me as distinct as possible, I beg to give the history of three cases out of twelve, which I have met with, and to the progress of which I have paid a good deal of attention.

The first case is that of a woman, twenty-six years of age, whose case I have had the opportunity of observing nearly throughout the whole course of the disease. She was born in Calcutta, of European parents.

April 5th. On the 28th ultimo she was attacked by slight fever, which increased on the two following days, and was attended with

head-ache, sickness at stomach, but no vomiting; she had slight pains in the limbs and back, and the face was suffused with a red blush. On the 30th, the eruption appeared in the form of numerous small inflamed papulæ, first on the face, and afterwards on the other parts of the body. At present, the seventh day of the eruption, and the ninth of the disease, the eruption is very numerous over all parts of the body, particularly upon the extremities and face; upon the latter of which the pustules on many parts coalesce, and contain a thick opaque fluid. The face is considerably swollen, as also the whole body slightly, and around the base of the pustules there is a light and circumscribed areola: she has a slight soreness of throat, but no salivation, and no fever has occurred since the eruption appeared: she complains of no particular uneasiness except what arises from the swelling of the face; the right eyelids are closed from infiltration, and the left are affected in a similar manner, but in a less degree. The eruption on the upper and lower extremities is also very thick, and on several parts the pustules coalesce; generally they have not attained that state of maturity which those on the face have, and on the lower extremities many do not contain fluid. On the face, and on the other parts of the body, where they are large, the vesicles are irregular and flat. This woman was vaccinated by Mr. Shoolbred, when an infant, and on the right arm the vaccine cicatrix is seen of the size of a garden pea; it is superficial, and shews imperfectly the stellated appearance.

April 6th. Eighth day of the eruption, and tenth day of the disease; the pustules coalesce thickly on the face, as also on some parts of the upper and lower extremities. On the face, they contain a yellowish, on the extremities a pearl-coloured, fluid; is a good deal distressed in making water, which she has frequent calls to do; urine of a high dark colour, and passed in very small quantity at a time. On the lower extremities, some of the pustules are circumscribed, and have a light blush of redness around their bases, but several of them are small, and contain no fluid; the redness of the face has somewhat subsided; she slept little last night, but was in no respect uneasy.

April 7th. Ninth day of the eruption. Several of the vesicles on the face have now broken, and have formed small yellow crusts. The pustules on the lower extremities are to-day in a state of greater maturity; some are better filled with a pearly-coloured fluid; she has had less difficulty in passing urine this morning, but it is still attended with straining. The smaller papulæ on the several parts of the body that are not yet filled convey to the touch the sensation of a small hard seed under the cuticle. On the feet, several large vesicles coalesce, and on one part, where it was a few days before her illness cut by a piece of glass, they are joined together, and there issues from the part a dark sanious fluid; was sleepless last night, but had no restlessness; the swelling of the face has subsided more, the right eyelids are now somewhat open, but still a little infiltrated.

April 8th. Tenth day of the eruption. The pustules are drying quickly on the face, and also at one or two small places on the arms. On the arms, neck, and chest, they are generally much larger and better filled than those on the lower extremities; there are many of them circumscribed, but the larger ones have large vesicles at top, which are irregular and flat; some of the vesicles on the fingers are of a very large size, and contain a thin pearly-coloured fluid. On the lower extremities, they have generally come to a less state of maturity, and many have not filled; the swelling of the face and eyelids is now quite gone, as also that of the other parts of the body: had a quiet but sleepless night; skin cool; has but little appetite; passes urine much better, though still at times with a little straining, but no pain.

April 9th. Eleventh day of the eruption. Pustules continue to dry fast on the different parts of the body, particularly the face, arms, and back: many are unbroken and shrivelled, and on the lower extremities many of the papulæ are of a small size, and they shew no disposition to assume the pustular or vesicular form. On the palms of the hands, they have consistence, are of a dark brown colour, and are hard and horny to the feel; this morning passes

urine freely, which is of a natural appearance: slept badly last night, and complains of irritation and pain on the skin; appetite indifferent.

April 10th. Twelfth day of the eruption. Pustules over the body generally continue to dry apace; some of the large vesicles that are unbroken are flaccid, and some have put on a radiated appearance. On the arms and lower extremities, several of the pustules have a dark-brown aspect; much itching of the skin at night, which prevented sleep; passes urine freely and in proper quantity; sore on the foot covered with a brown crust.

April 11th. Thirteenth day of the eruption. The scabs are falling fast; many of the pustules have not come forward, they are of a dark brown colour, and are hard to the touch; slept well during the night, but experienced at times a sense of burning heat of skin; an unpleasant smell from the surface of the body.

April 12th. Fourteenth day of the eruption. A tolerable night, but still complains of the smarting heat of skin, which is however less: has no particular uneasy sensation: the scabs are generally of a dark-brown colour, and are falling in numbers: effluvia from the body still offensive.

April 13th. Fifteenth day of the eruption. Slept well last night; sense of heat of surface gone off, but her arms continue to itch a little; scabs still falling: many small ones on the extremities are hard, and are of a claret colour; smell of body no longer offensive.

April 14th. Sixteenth day of the eruption. Has had a good night; appetite keen: where the scabs have fallen off, the skin is of a lively red appearance: a second yellow crust, partly detached, has formed over a great part of the body; claret-coloured spots fewer in number, but the papulæ are still rough and hard.

April 15th. Seventeenth day of the eruption. Makes no complaint; the dry yellow cuticle is still peeling off, and where the crusts have fallen, the skin is of a light red colour.

April 17th. Nineteenth day of the eruption. On the sides of the face, where the scabs have been pressed, they still adhere to the skin, and from under them a little fluid issues; the yellow cuticle is fast coming off; says that she has felt her eyes weak for some days past.

20th. Convalescent.

The second case I have to relate is that of a young man, twenty-six years of age, an Indo-Briton.

April 7th. On the 4th instant he was attacked with slight fever, which on the two following days became very severe, attended with violent head-ache, nausea, but no vomiting, except on taking medicine, when he then threw up a quantity of bile: complained of pain in his back and loins: has not slept for the last three nights; thirst excessive; stools bilious, tongue thickly coated: has no erythematic efflorescence of the face; eyes water a good deal; is very restless and uneasy at night. This morning on all parts of the body he observed small red papulæ, a few are larger than the rest, and contain an opaque fluid, but the whole are not numerous. He was vaccinated when four or five months old by Dr. Hare of Calcutta, and on the left arm there is a small superficial cicatrix, which is slightly pitted.

April 8th. Second day of the eruption, and fifth of the disease. The small red papulæ are to-day numerous over all parts of the body, but particularly on the face and upper extremities; they feel to the touch like small seeds, of a circular form, under the skin, and are rough and hard when the fingers are run over them; only a few on the arms and face have a small vesicle at top, containing a little fluid, of an opaque colour; fever left him about twelve o'clock last night; has vomited once; slept but little: feels nausea after eating; tongue cleaner; pains have left him; no thirst; skin cool and comfortable; pulse regular: says he feels languid from want of sleep; no sore throat, salivation, or cough; believes he caught the infection from a young man, 24 years of age, a patient of mine, whom he had visited two or three times whilst he was labouring under the disease.

Arril 9th. Third day of the eruption. Slept more last night, but had uneasy and unpleasant dreams; papulæ much the same in number as yesterday, and close to each other, but separate and distinct: a few more of them have a small vesicle at top, containing a whey-coloured fluid; they are pretty thick on all parts of the body, particularly on the upper parts; on the lower extremities they are less numerous; skin cool and soft; pulse regular; stools yellowish; urine high-coloured.

April 10th. Fourth day of the eruption. Nearly the whole of the pustules to-day have a small vesicle at top, containing a whey-coloured fluid; they are generally larger than yesterday; on some few places they coalesce; the margins of the pimples around the vesicles are inflamed, but the areola around their bases is small, and the skin between them is of a natural appearance; without sleep the whole of last night, and restless from the irritation and itching of the eruption, but had a short sound sleep this morning: face a little swollen; strains a little in making water, but the urine is not deficient in quantity, nor is it of so high a colour as yesterday.

April 11th. Fifth day of the eruption. Had no sleep last night in consequence of the burning sensation occasioned by the eruption: the fluid the pustules contain is a little more opaque; some are slightly irregular in form, but most of them are circular; some are large, others small, having little red-coloured areola around their bases: on some parts they coalesce, particularly on the hands, where they are large. On the face, which is more red and swollen than yesterday, the pustules are small in size, and very numerous; their margins are of a bright red colour: what little sleep he has is interrupted by unpleasant dreams.

April 12th. Sixth day of the eruption. Slept soundly the greater part of the night; burning sensation of the eruption considerably lessened; the pustules on the face, which are small and prominent, are filled with a thick white matter; those on the arms, chest, abdomen, and back contain a thinner opaque fluid: on

some parts they are large, irregular, and flat; on other parts they are small, circular, and prominent, and many are depressed in the centre; a few have burst and formed small yellow crusts at top, but a considerable portion of the eruption exhibits a solid or papular character. On the upper parts of the thighs, the pustules are small and flat, and join together, and the fluid they contain is clearer and thinner than that on the upper parts. On the legs they are small, many contain no fluid whatever, some are a little shrivelled, and the areola around the most of them is of a dark red colour. On the feet, on some parts, they are large and flat, are well filled with fluid of the same character as that on the upper parts. Has no uneasiness of any kind; pulse natural.

April 13th. Seventh day of the eruption. On the lower extremities, the vesicles are quickly desiccating, the large ones have flat dry crusts at top, and the small pustules are quickly disappearing; nearly the whole of them are of a dark red colour, and several have little or no areola around them; some smaller ones have an opaque fluid in them. On the arms, chest, and back the vesicles are not desiccating so quickly as those on the lower extremities; some are of a large size, irregular, and flat, and contain an opaque fluid; a few others a yellow matter, and are prominent; they have generally a greater degree of inflammatory areola surrounding them. On the face, the pustules are still small and prominent, and contain a thick yellow matter; some few are drying, and have a small yellow crust at top; the swelling and redness of the face is not so great as yesterday. On the feet a few pustules are large, irregular, flat, and puckered, and contain a bluish coloured fluid: slept indifferently last night; complains of itching over the body, with exception of the face, which feels as if the skin was put upon the stretch; no burning sensation; pulse natural; appetite good; no thirst or other sourse of uneasiness.

April 14th. Eighth day of the eruption. Slept well the whole of the night; dark-brown scabs are to-day numerous over all parts of the body, many of which have fallen off; some few pustules on the feet still contain a thick opaque fluid. On the

arms, and on the upper part of the chest, there are also a few that contain fluid; desquamation on the face goes on, and the tumefaction has subsided there, but there still remains some degree of erythematic redness; around the pustules, on the lower extremities, there are small areolæ of a dark red colour. On the arms and chest, the areolæ are more florid; feels upon the whole easy and comfortable.

April 15th. Ninth day of the eruption. Has not slept so well during the night; the scabs continue to fall off on the different parts of the body. On the face, they have fallen off, and left tubercular elevations, which are red and prominent. On the arms and chest, where the scabs have fallen off, the skin is of a bright red colour; several papulæ on different parts have not come to maturity; a few pustules on the left foot still contain a little fluid; feels in all respects well.

April 16th. Tenth day of the eruption. The vesicles on the foot, that contained fluid yesterday, are dry to-day, and encrusted at top; the scabs over the whole body have nearly quite dropt off, and have left the skin underneath of a lively red colour; the tubercles on the face are still red, prominent, and hard.

April 17th. Eleventh day of the eruption. Tubercles of the face as yesterday, with a disagreeable sense of tightening of the cheeks; slept the whole of last night; arms, back, and chest nearly clean of scabs: on the lower extremities a few small brown ones remain.

April 18th. Twelfth day of the eruption. Desquamation of the body generally almost completed; tubercles on the face softer and less red; some on the hands are of a like character; appetite good; no uneasiness of any kind.

20th. Convalescent.

The subject of the last case is another young man, twenty-six years of age, a European.

April 15th. On the 8th instant, he was attacked with slight fever, attended with drowsiness, head-ache, and pain over the loins. On the 9th, the fever was severe; head-ache worse; nausea and vomiting of bile. The morning of the 11th, he observed some few hard red papulæ on his face; the fever then subsided. On the 12th, he had slight soreness of throat and salivation. The pustules on the face to-day are about fifty in number, and contain a yellow-coloured fluid. On the neck, chest, and back, there are about fifty or sixty pustules. On the upper extremities, about thirty, and on the lower about twenty, in general surrounded by small light red areolæ. On the lower extremities, the fluid in the pustules is of a straw-colour; complains of giddiness on getting into the erect posture; slight cough; tongue white; some thirst; urine high-coloured; pulse natural; no appetite; sleep much disturbed by unpleasant dreams. He was vaccinated in his infancy in England, and on his left arm, there is an oblong cicatrix, about half an inch long, and less in breadth.

April 16th. Sixth day of the eruption, and ninth of the disease. Passed a restless night; vomited once after taking medicine, and brought up some bile; fluid in the pustules on the face, neck, and chest of a thick whitish appearance; on the arms, it is opaque, and on the lower extremities, it is more clear and watery; the pustules are small, and have a small areola encircling each; thirst continues; head-ache gone; pulse and heat of skin natural.

April 17th. Seventh day of the eruption. Several pustules on the face have become dry, and have small yellow crusts at top. On the upper and lower extremities, they still contain a whey-coloured fluid; some are drying, and others are already shrivelled up. On the head, they contain a purulent matter. On the upper extremities, most of them are of a small size. Slept well last night; appetite good; makes no complaint of any kind.

April 18th. Eighth day of the eruption. The scabs on the face are quite dry, and the crusts of most of the pustules, as likewise some of those on the head, have fallen off; the greater part of those also on the other parts of the body are dry, but

some still contain a whitish fluid and itch slightly. On the feet, a few are of a large size, contain a bluish-coloured fluid; are well filled, and have their bases surrounded by a light red areola, about a quarter of an inch broad.

April 19th. Ninth day of the eruption. Red marks on the face are disappearing, and the pustules on the other parts are undergoing absorption; feels easy and well.

20th. Convalescent.

From the cases of varioloid disease, which have occurred at the present time so extensively in Calcutta, the opinion entertained by some of the medical profession, that after a lapse of time, the Cow-pox loses its power as a preventive of Small-pox, would appear to be in some degree confirmed; yet, as a general rule, I think, there is no doubt that vaccination, when successfully performed, in a very large majority of cases, does prove permanent in its influence; and that even in those instances, where it may be of partial efficacy only, the varioloid disease, which supervenes, is in almost all cases in a remarkably degree modified by the influence which the vaccine still continues to exercise.

We all know, from the time that the Jennerian discovery was first promulgated, its claims to be considered an antidote against variola have been warmly discussed; but now that we have the advantage of more extended experience, the merits of the question may be brought more accurately and satisfactorily to the test.

In the last volume of the Transactions of this Society, there is a paper by Mr. CAMERON, Superintendant of Vaccination, on which I wish to offer a few remarks.

The object of Mr. Cameron's communication appears to have been two-fold: first, to shew that the variolous disease had prevailed extensively throughout the provinces under this presidency, in 1829-30; and secondly, to point out to what extent the disease had occurred after vaccination. He had access to the records in the office of the Medical Board of Bengal, and from the documents with which he was liberally supplied, he furnishes extracts from the letters of several medical officers relative to the above points.

Mr. Cameron says, "In consequence of the prevalence of small-pox at many stations under this presidency, during the last twelve months, a Circular Letter was issued by the Medical Board, calling upon the Medical Staff, to furnish information on the subject, and more especially desiring a statement of any cases in which variola had supervened on vaccination."

"In the replies received, it appears, that although variola prevailed extensively, and at some stations assumed the epidemic form, not one case is related of genuine small-pox succeeding to perfect vaccination. In many cases that had been previous-

ly vaccinated, a varioloid disease shewed itself; went through its course mildly, and disappeared in a few days."

Mr. Cameron, from the general tenor of his communication, as likewise from the concluding part of the above paragraph, evidently means to assert, that the disease succeeding to vaccination, in no instance in the reports furnished, assumed a determined and severe character, whether of small-pox, or any other eruptive disease of a serious nature; a deduction I conceive unquestionably erroneous. In fact, in nearly the whole of the documents he adduces, we find cases recorded of a virulent, and even fatal character, of the varioloid disease, or small-pox, succeeding to perfect vaccination. I refer to the reports themselves, and leave it to be decided, whether Mr. Cameron is justified in his conclusion, that "not one case is related of genuine small-pox succeeding to perfect vaccination."

The other cases of the varioloid disease, which have come under my immediate care, have been in individuals of European parents, born and vaccinated in India, of the ages of 7, 13, 19, 22, 22, 24, 27, 28, and 29. Most of them exhibit on one or both arms a well defined vaccine scar, and with the exception of one, a very severe case of confluent small-pox, in the lad 13 years of age, all the others bore the character of a mild and tractable disease.

In conclusion, I beg to remark, that persons labouring under modified Small-pox will communicate an unmodified disease to those who have no protection by previous Small-pox, or vaccination : and although, generally speaking, it is usually mild when communicated to those who have been vaccinated, and is not of very frequent occurrence ; yet, in occasional cases, it assumes a severe, and even fatal character. Its source is the variolous poison, especially when prevailing epidemically in a virulent degree ; but whether it arises only in consequence of vaccination being unsuccessfully performed, or at improper seasons of the year ; or in those only whose vaccine vesicle may have been injured ; from atmospheric causes ; from peculiarity of temperament ; from vaccination imparting but a partial security to the constitution ; from the vaccine virus having become deteriorated by age, or by transmission through many individuals, are points on which in the present state of our knowledge we are perhaps only able to decide imperfectly.

The susceptibility of Cow-pox returning after a time, and the susceptibility of taking Small-pox after vaccination ; as well as the identity of Small-pox and Cow-pox, and mode of producing Cow-pox in the cow, with the object of reviving the vaccine lymph, are subjects which engage the attention of medical men at present in Europe. In this country, we have an immense field for the exercise of ingenu-

ity, and elucidation of truth ; and as we have reason to know, that the Cow-pox, or *mata*, in the cow, is by no means an uncommon disease in India, it is to be hoped, that some members of this Society may have opportunities of communicating their sentiments on such important and interesting points.

Calcutta, June 2, 1832.

ON

ABSCESS OF THE LIVER

IN

EUROPEAN SUBJECTS AT THE MADRAS PRESIDENCY.

By W. GEDDES, Esq.

Presented 2nd June, 1832.

In submitting the following paper upon abscess of the liver, I am chiefly actuated by a desire to contribute, in however small a degree, to the objects of the Medical and Physical Society of Calcutta. The subject which I have chosen is one of the greatest interest to medical men in India. It has chiefly attracted my own attention from my observation of the numerous casualties in a body of Europeans under my charge, which dissection showed were to be referred to the occurrence of this disease; while the symptoms varied greatly in almost every case previous to death, and the fatal event seemed to depend often upon the presence of peculiar affections, superadded to those more immediately resulting from the collection of purulent matter. Founding my inquiries upon the abscess as observed on dissection, I was induced to trace the history of each of the above individuals upwards from his death to the period of his arrival in this country; taking notice of the

peculiar disorders or symptoms which had been recorded in his cases, if in hospital, in the interval; endeavouring to ascertain the earlier symptoms of his disease, the period after arrival in India when it began to show itself; whether its original occurrence could be traced to any peculiarity of age or constitution; and, in short, investigating every object of interest which might tend to elucidate, in any degree, the nature of this insidious disorder. The result I have arranged in the following pages, and have adventured a few opinions and inferences, which, although the facts in my possession may not be sufficiently numerous to confirm, may afford hints to others having the means and inclination to prosecute the inquiry.

The body of men in which these observations have been made was originally named the 1st Madras European Regiment, but from the 1st of January, 1830, it has formed the right wing of the Madras European Regiment. For two years previous to the 1st of July, 1828, this corps had been stationed on the sea coast in the fort of Masulipatam (Latitude 16° 9′ 8″ N. Longitude 81° 11′ 38″ E.) and it moved from thence to its present inland station (Latitude 21° 16′. Long. 79° 46′), on the 15th December, 1829. It arrived at Kamptee on the 5th of March, 1830, and has remained here without alteration since that period. The late 1st European Regiment had been in Ava during the whole of the Burmese war, and had landed from thence at the commencement of its sojourn at Masu-

lipatam. It had lost many men while in Ava, and many had been invalided or died shortly after its arrival on the coast, so that on the 1st of July above-mentioned, there were only 153 individuals in the corps who had been more than two years in India. The remainder formed a body of generally young men, who had joined the Regiment chiefly in 1827, and there were also additions made till July 1829, amounting altogether to 543 individuals; the number of subjects accordingly for observation being 696. Of these 75 have been removed at various periods from the regiment, by transfer to other duties, or corps, or by discharge from the service, or invaliding.

In this body of men, the monthly admissions into hospital, from the 1st of July, 1828, until the 1st of January, 1830, during which period the corps may be considered as having been on the sea coast, averaged 121; the average number of men present being 603. In this interval, 97 cases of hepatic disease are reported to have occurred. From the beginning of 1830, until the 1st of April, of the present year, the average admissions in the month have been 123, the average amount of subjects affording them being 592, and the number of hepatic diseases reported is 131. In the first of these periods, 50 deaths took place; and in the latter, including 19 caused by two visitations within the interval of Epidemic Cholera, 58 cases proved fatal; making a total of 108. With few exceptions, all the bodies of those deceased have been

opened, and the exceptions have only occurred, from the diseases of which the patients have died, giving no reason to expect any tangible organic changes on dissection. In 28 of these cases abscesses have been discovered in the liver, and there being no reason to suppose, in any of these instances, that the fatal termination was not produced directly, or indirectly, from the disturbance excited in the constitution by the presence of this organic mischief, the proportion of casualties, therefore, from this affection, would appear to have been one-fourth; or with the exception of Cholera, one-third of those from all other diseases. Of these cases, 19* were under my immediate charge; and, with the exception of two, all the others are recorded in the hospital journals.

I now beg to refer to the Table, No. 1, at the end of this paper. By this table, it appears, that from the 1st July, 1828, to the end of that year, there were seven deaths from abscess of the liver; in 1829, there were nine; in 1830, four; in 1831, six; and, in January of 1832, two deaths occurred from this disease. During the first year and a half, of the 16 individuals who died, nine were Irishmen, and seven English; of the four in 1830, two were English, and two Irish; of those in 1831, four were Irish, and two English, and both the casualties of

* Three of these were transferred to the garrison hospital of Masulipatam, on the corps' march from that station; but Mr. Assistant Surgeon George Thomson of this Establishment, under whose charge they remained, has obligingly furnished me with the continuation of their cases, and dissections.

January, 1832, occurred in Englishmen, making altogether 15 from Ireland, and 13 from England, who have died from this disorder. This, in proportion to the number of each nation in the corps, gives one in 22 of the Englishmen, and one in 24 of the other; while of 42 Scotchmen, in whom there have been six deaths in the period referred to, none has presented on dissection an abscess in the liver.

The professions, or means of livelihood in Europe previous to enlistment, may be expected both physically and morally to effect the individual, and thus, on his becoming a soldier, and visiting another climate, to have an influence on his constitution and conduct, and thereby to modifiy the nature of the diseases to which he becomes liable. I have therefore added a column, showing these circumstances; but, from the number of individuals being so few, no certain inference can be drawn from it. The only circumstance worthy of remark is, that of the 16 fatal cases, while on the sea-coast, 11 are stated to have occurred in labourers; while there was only one of this class in the 12 instances which took place afterwards.

As far as my observation has enabled me to form an opinion, the subjects of these affections may be classed, as connected with their constitutional peculiarities, under three heads; 1stly. Young lads, with light red, fair, or brown hair, having occasionally freckled faces, and with eyes either of a light-blue,

or light-grey, or accompanying the darker hair, of a hazel colour. These have generally presented in their appearance also the delicate skin and formation of the scrofulous habit of body. 2ndly. Individuals who have come out to this country at a late period of life, and are perhaps acted upon by depressing passions; and, 3rdly, men who have been beyond six years in India, and have most likely led an irregular life there. To the first class, of the 19 patients who have been under my care, 12* belong; to the second, 7†; while, under the third head, two‡ would appear to be with propriety classed. The remaining seven, referring to their age, and short residence in India, might have been safely considered, I believe, to have belonged to the first class abovementioned, but there are no sufficient or certain data to be obtained to satisfactorily settle this point.

Abscess of the liver presents in its earlier stages so much obscurity in the symptoms, and appears to continue its course often in so insidious and various a form, that it is an extremely difficult point to fix the exact period at which the disease may have commenced, and thus to ascertain the interval which has taken place from arrival in India until the patient's becoming affected with it. In the table already referred to, I have introduced a column, showing the first apparent indications of hepatic disease; and another,

* Nos. 13, 15, 16, 17, 20, 21, 22, 23, 24, 25, 27, 28.

† Nos. 10, 11, 12, 14, 18, 19, 26.

‡ Nos. 7, 8.

wherein is exhibited the period at which these made their appearance, after the arrival of the patient in this country. I shall advert afterwards to the reasons which induced me to assign the various symptoms in the first of these columns, as indicative of the abscess having formed ; and have only to say here, that I am satisfied, with the exception of those of a dysenteric nature, that there has not been any material error made in considering the disease, at least, existing, at the time at which these symptoms showed themselves. Where Dysentery has preceded the other indications of hepatic disorder, it does not appear to me, that we have, in general, any sufficiently diagnostic indications to enable us to say whether the abscess is a cause or consequence of the former ; although from a belief of its generally being the source of the dysenteric disorder, I have inserted the latter in the column alluded to as a symptom of the presence of the hepatic affection. As far therefore as can be ascertained from these columns, the existence of the abscess is considered to have manifested itself in one case, under the dysenteric form, within 22 days from arrival in India ; in two, within six months, one of them likewise being of a dysenteric nature ; in four, within twelve months, and in the remainder as follows, viz. In 7, within or at 18 months,

4,	2 years,
3,	3 years,
2,	4 years,
3,	5 years,

and in the remaining two above this period.

These manifestations have shown themselves chiefly in the wet season; and this fact, as well as the general aspect under which the disease commenced, will be seen by the following table:

Months in which the first apparent indication of Hepatic Disease is recorded.	*Chief symptoms of the Disease.*			
	Pain.	*Dysentery*	*Pyrexia.*	*Total.*
January,	1	1	—	2
February,	—	—	—	—
March,	—	1	—	1
April,	1	—	—	1
May,	—	—	1	1
June,	2	3	1	6
July,	2	2	1	5
August,	2	2	—	4
September,	2	—	1	3
October,	1	1	—	2
November,	1	—	1	2
December,	1	—	—	1
	13	10	5	28

From this it appears, that in the wet months of June, July, August, and September, 18 cases have occurred; in the four months of the cold season, commencing with October, seven cases have been met with, while in the hot-season only three have been observed. The period which has elapsed from the first appearance of the symptoms, until the death of the patient, has been extremely various. This circumstance has been owing apparently in a great measure to the site of the abscess, and to the constitutional peculiarities of the patient, whereby the symptoms have quickly

or otherwise shown themselves; or, when produced, have varied in their characters, or have shown a greater or less degree of violence or activity. The patient's reporting himself sick at an early period of the attack must also, it is believed, have affected the further progress of the disease. The most rapid termination, after the patient applied for assistance, took place in eight days, where the symptoms were violent when they became observable; but where, from the size of the abscess on dissection, it appeared, that the site of it and constitutional peculiarities may have prevented any disturbance of the system for a long period. In two other instances, also, under like circumstances, the death took place, in one, after 14, and in the other, in 24, days, from their reporting themselves sick. This degree of rapidity, however, has been rare. The more general progress of these cases has been, either, that the symptoms have not shown themselves till the last admission into hospital, as in eight instances, in which the disease lingered out under occasional amendments for a period of from 40 to 118 days; or that, as in the remainder, the patient has become sufficiently recovered to return to his duty, but by a relapse of his former symptoms, or the appearance of the disease under some other form, he has been obliged to return to hospital at various intervals, until the disorder has at length proved fatal. This event has taken place under from one to 13 admissions on the sick list, and at various periods on to two years from the first apparent indication of hepatic affection. The disease has thus terminated

in two individuals within six months after their arrival in India; in four, at one year's residence; in three, at or under a year and a half; in five, within two years; in five, within or at three years; in four, within four years; in three, within or at five years; in one, in seven, and another in 12, years, after they had arrived in this country. In the wet season, twelve have died; in the cold season, thirteen; and in the hot weather three.

On a reference to Table, No. 2, the site and size of the abscess will be observed, as found on dissection. From this table, it appears, that the most common description has been a large and solitary collection of purulent matter; and this, most generally, has been situated in the upper part of the right lobe of the liver, towards its posterior surface. Fifteen of twenty-six abscesses were placed in this situation. In two of these, the disease had penetrated the diaphragm and lungs, part of the contents of the abscess having been brought up by expectoration; and in another, the collection of matter pointed outwards between the ribs, and had been laid open some time previous to the patient's decease. In the remaining twelve, the abscess continued entire, bounded either by the substance of the liver, the ribs, or diaphragm. In three cases, the collection of matter was found near the lower margin of the right lobe, which adhered in two of them to the colon. The left lobe was, only in two instances, the seat of a solitary abscess; in one of them, the tendency of the disease was to-

wards the concave surface, where the abscess had burst, and its matter became diffused over the abdomen: and in the other, the seat of the disease was in the upper convex portion of the lobe. In one case, there was one large abscess in the centre of the right lobe, and a small one in the left; while, in the remaining five of the 26 cases recorded, the disease consisted in a number of small abscesses, diffused through the substance of both lobes of the liver.

It is unnecessary to give a minute description of these abscesses. Where none of their contents had escaped by expectoration, or otherwise, previous to death, they were, when only one or two in number, almost always large, containing in some instances a quart of purulent matter; their sides being either a layer of coagulable lymph, with greyish granulating looking surfaces, or without any layer of this kind, the matter appearing mixed with the substance of the liver. Where much of the pus had escaped for some time before death, as in one case externally, and in another by the lungs, the abscess was considerably contracted, and its sides were of a firm hard texture. When the abscess had attained the external surface of the liver, it was bounded here by a firm tendinous-looking layer, and this generally adhered firmly to the ribs, or the adjoining viscera. Adhesions were found in most instances near to the site of the abscess, connecting the liver with the adjacent parts; and in the cases where the collection of matter penetrated the diaphragm, adhesions connected the

lower lobe of the right lung with the diaphragm and liver. The contents of these abscesses have been generally healthy-looking purulent matter, more thin and watery in the portion which lay uppermost, containing occasionally some curdly fragments, and readily escaping when the cyst has been cut into. The substance of the liver, otherwise, has appeared, in some instances, paler and harder than is natural; in others, it was of a dark chocolate hue, or presented over the abscess a red and yellow brindled appearance; but in several cases, little of an unhealthy aspect was exhibited. In one extraordinary instance, where the abscess was a large one, situated in the left lobe, a needle was found firmly imbedded in the centre of the right lobe, at a distance from the diseased part. This was the case, where the abscess had burst into the cavity of the abdomen.

The liver has generally been protruded beyond the ribs by the distention of the abscess, giving rise to the appearance of enlargement of this organ; but this does not seem to be often actually the case, and on cutting into the collection of matter, the liver, having a flabby bag, from whence the pus had escaped, is seen otherwise to be of its natural magnitude. The contents of the gall-bladder are almost always either thick, tarry, and dark-coloured, or of a thin glairy consistence, and more or less tinged of a brownish, or brownish green or yellow hue. It has also been observed distended with such contents, and has protruded beyond the edge of the liver.

In the large intestines, the diseased appearances were generally in proportion to the degree of dysenteric affection, immediately preceding death. In 10 cases, where there was either no irregularity, or the bowels were inclined to constipation, or the evacuations, although loose, were more of a diarrhœal nature, and generally unattended with blood, little or no disease, with the exception of some contraction of the colon, was met with. In the remaining cases, ulceration or disease was discovered in all degrees, in proportion to the previous dysentery, and varying from one or two superficial ulcers in the head of the colon, to general ulceration, with thickening of the large intestines. It may be remarked, that in all the instances, with one exception, where the intestines were found healthy, the abscess was situated in the upper and outer part of the right lobe, or deep seated in this lobe; but in the five other cases, where the collection of matter was thus situated, all had severe dysenteric symptoms in the course of their illness; and in Nos. 22 and 28, this affection was more immediately the cause of death. In one case, where the disease in the liver was in the inferior margin of the right lobe, and contiguous to the colon, there was no disease of the intestines; in another, there were only one or two superficial ulcerations, where the liver adhered; and in the third, there was more extensive ulceration. The disease of the intestines, where the left lobe was the seat of the abscess, was not very conspicuous on dissection, nor the dysenteric symptoms severe at the time of death; but, in all five

cases of numerous abscesses, the intestines were peculiarly affected.

The symptoms of an abscess having formed in the liver are modified, as above alluded to, partly by the site of the abscess, but chiefly from peculiarities of constitution in the patient, which cause them to vary in some degree, in each individual. No two cases have been found exactly alike, either in their symptoms, progress, or generally speaking, in their cause of death. There does not appear, either, any one symptom which has been constantly present in cases of this description; or which is not occasionally met with where dissection afterwards proves that an abscess in the liver had not existed. Hence, in many instances, an uncertainty in the diagnosis, the result of which is more particularly evident from the different designations given to the disease on the patient's last admission into hospital. Thus it will be seen from one of the columns of Table No. 1, that in reference to the symptoms which had chiefly attracted attention, on the patient's reporting himself, 16 only of 28 cases had been named liver or hepatic disease. Five were considered dysentery; two continued, and one intermittent, fever; two abdominal inflammation; one chronic diarrhœa, and one debility. The same circumstance would be equally evident, if the designations of the attacks preceding the fatal one were in like manner examined. From the above terms, however, as well as the table at page 291, and the fact is confirmed by an examination of the cases,

it appears, that the most common and earlier symptoms of the disease are either,—firstly, some description of uneasy sensation referred to the site of the liver, or to the adjoining parts, as the thorax, abdomen, or right shoulder:—secondly, affection of the bowels, either of a dysenteric or diarrhœal nature:—and thirdly, pyrexia under different forms. Sometimes two or more of these morbid indications are combined, particularly a degree of pyrexia with either pain or dysentery: but in general, where the dysenteric symptoms are severe, there is little pain of side; and again, where the pain is urgent, there is not much annoyance from affection of the bowels.

From many of the cases, there can be little doubt entertained, that the process of suppuration in the liver may be unattended with pain. Thus in the most rapid of them, where the patient was only eight days in hospital, and it is stated in the journal, that the pain had seized him on the preceding day, and was removed, although for a time only, by venesection to the extent of two pounds of blood, and 88 leeches in the first 24 hours of his being in hospital, a large abscess, containing a pint of matter, is recorded as being found upon dissection in the right lobe of the liver. In No. 4, no pain was reported to exist in the region of the liver throughout the disease, while in Nos. 5, 8, 12, 23, and 24, none was reported until from 8 to 14 days before the death of the patient. In several other cases, the pain which has been extremely slight and transient, and in almost every

instance, where the collection of matter has been found even to the extent of a quart, there have been periods of perfect immunity from this symptom, sometimes of considerable duration, while from the size of the abscess on dissection, it is impossible to conceive that the purulent matter had not existed, and been progressively increasing at these periods, or that where there had been no pain felt until shortly before the decease, the symptoms which were previously met with had not been caused by the presence of a collection of this description. These considerations may in some measure explain my having dated the commencement of the disease in some instances at so long a period prior to the death of the patient; even where there was no pain complained of in the site of the liver, and my having referred various feelings and symptoms which are found recorded, to the presence of an abscess in this organ, when dissection afterwards proved that such was ultimately the cause of death.

Referring to the site of the abscess, where this has been found in the right lobe, the symptom of pain has been observed to vary in its intensity, and continued nature, its situation, and in the interval which elapses between its being taken notice of, and the death of the patient. In No. 3, where it is recorded as being in the right shoulder, shooting through the chest, the pain was only noticed, without previous indication of disease, eight days before death, and is stated to have been occasionally absent.

In No. 5, after having been under treatment for 35 days, with symptoms of fever, and irregularity of the bowels, the pain of side was reported on the sixth day previous to death; and, in No. 9, after occasional attacks of a dysenteric nature, the patient was admitted into hospital, having a pain shooting up from the pit of the stomach to the right shoulder, eight days before his death. In No. 10, having been troubled with dysenteric symptoms for some time, a severe pain was complained of in the region of the liver, shooting up to the shoulder, about six months previous to decease. This was removed for a time, but returned occasionally, until his last admission into hospital, 19 days before his death*. In No. 11, there having been previously occasional irregular attacks of dysentery, the patient was received into hospital about five months before he died, with pain at the side, chest, and breast, shifting afterwards to the right side, and this continued to recur upon him at times, with pain also in the right shoulder, until his last admission into hospital. He had then pain of the shoulder, and in the right side, behind the margin of the ribs, not affected by pressure; and, also a severe pain near the spine, on the same side, particularly felt on

* In this case the pain is described to occupy a defined space, near the edge of the lower false ribs, and was increased on pressure. The pain having disappeared for some days, is reported to have returned, and was now felt about an inch below the edge of the ribs, extending up to the shoulder and arm of that side; it was increased on pressure, and inspiration. It disappeared and returned once or twice, but had left him entirely for several days before his death.

going to stool, with a general sensation of uneasiness over the abdomen. He never entirely got rid of these pains, although they sometimes were less in degree than at others, and two days before his death, there was an aggravation of the pain, attended with a sensation when lying over to his left side, as if something were falling away, and giving pain in the other side.

In No. 14, the pain was present in the side at the admission into hospital, 118 days before death. In this long period, there were occasional intervals, in which no pain was felt, especially towards the termination of the case. At other times, it was more or less severe for several days, and is described as being felt along the edge of the ribs on the right side, extending up to the shoulder when he made a long inspiration; or increased on pressure between the ribs, near the spine; or at the precordia. Upon one occasion, it is stated, that the patient had little pain, excepting for half a minute, on lying down, when he experienced a sensation of something being about to burst in his side, and some cough and pain were excited at the same time. Latterly, this patient complained more of pain in the shoulder than near to the site of his disease.

In No. 15, after some attacks of a dysenteric nature, the patient was admitted into hospital about seven months before his death, with pain of the sides and shoulder. These however were, for the time, soon removed, but he appears to have felt them occasionally until the next period of the case being record-

ed, three months afterwards, when the pain was stated to be more severe, and situated a little below the ribs on the right side, increased on pressure, and on inspiration. In a month more, the pain occupied the site of the greater part of the right lobe of the liver, extending to the edge of the ribs, where the uneasiness was felt most severely on pressure; on a long inspiration, it extended to the shoulder, and continued to be very distressing until 21 days before his death, when he began to cough up pus, the pain was generally felt, although at times slight, and only observed in getting up suddenly, or lying down, or after moving about for any time; or on a long inspiration. It continued to affect the site of the right lobe and the shoulder, but after the communication between the abscess and lungs became established, the pain of the latter place left the patient, and that of the side was less, but felt at times as a general soreness over the side on coughing. Some inflammation and pain were excited in the throat, apparently by the irritation of the purulent matter, and constant hawking.

In No. 16, dysenteric attacks preceded the more decided symptoms of abscess in the liver, and the bowel complaint continued till the death of the patient, to be the most conspicuous disorder. Pain of the side was only felt at long intervals of two or three weeks, remaining for a few days at a time, and was described as being a stitch or severe pain in the right side of the chest, about $2\frac{1}{2}$ inches below the nipple, increased by in-

spiration, or cough, pressing on the part affected, and lying over to the right side. There was also, at one period, pain of the shoulder, which was likewise increased when lying on the right side.

In No. 19, the patient had been about 25 days affected with dysenteric symptoms, in the course of which, he voided about five inches of intestine. During this period, however, he had complained of no pain at the right side, although other symptoms indicated the presence of some mischief in the liver; and till his death, 40 days afterwards, he only felt pain occasionally, and at long intervals, which was situated at the edge of the ribs, near the head of the colon, and felt more particularly in moving the body backwards or forwards; at times it was remarked to extend rather further towards the os ilium.

In No. 20, where the abscess pointed externally, the patient had been subject to severe rheumatism, one attack of which, 18 months before his death, was accompanied with a degree of dysenteric affection; the pain then stretched up the right side, and gave some reason to believe that a degree of affection of the liver existed at that period. The more distinct indications of the disease, however, may be dated from about nine months preceding his death, when he complained of a pain in the right side, extending upon inspiration to his shoulder. This was removed, but returned occasionally, without his reporting himself at the hospital, until $4\frac{1}{2}$ months

before his death, when the pain was increased, occupying the site of the right lobe of the liver, stretching up along the breast to the shoulder, and preventing respiration, or lying in any position excepting the left side, or partly between this, and the back. These symptoms were likewise removed in some degree for about a month, when they returned with aggravation. At this period, the pain was more confined to the spot where the abscess afterwards protruded; was of a severe darting nature, preventing respiration, and accompanied with a gnawing pain in the right shoulder, and inability to lie on either side. In a week afterwards, a swelling was observable in the above spot, at the angle of the ribs, and about four inches from the last false rib, which was very painful, to the extent of half a crown, on the least touch. This swelling increased in size, accompanied at first with stitch-like pains, and afterwards of a strong pulsating nature. The tumour became prominent and red, and at the period of its being cut into, 50 days before his death, was tender and elastic to the touch. A large quantity of matter was discharged at first, on the incision, and with considerable amendment in the state of the patient; but from the pus not always finding a free vent, he had occasionally considerable pain of the side, which was relieved at the time by a full discharge of the matter. He eventually died from severe convulsions.

In No. 22, there is reason to believe some organic disease had taken place 10 months before death;

the patient complaining at this period of a pain in the sternum, stretching towards the left side, impeding respiration, and increased on swallowing any liquid. In two days afterwards, the pain is stated to have moved further down towards the end of the sternum; was felt more unsteadily, and was described to be like a painful ball coming occasionally up his throat. On the following day, it was only felt in getting up suddenly, but returned for a short time, giving a sensation of soreness in the part of the belly formerly affected. This soon however left him, and no pain is reported until five months afterwards, although he was several times in hospital with local complaints, when with other pains of the joints, he had a pain in the right shoulder. These complaints however subsided, but in six weeks afterwards, he was again admitted into hospital with symptoms of fever, and then the disease of the liver began to show more decided indications of its existence, which continued with temporary amendments till his decease, $3\frac{1}{2}$ months afterwards. The chief site of pain at the commencement of this period was generally in the right lobe of the liver, but shifting to different parts of it, and occasionally no pain was felt. In a further stage of the disease, when combined with dysentery, there was pain at times reported near the head of the colon, and at others, along the edges of the ribs, and more towards the scrobiculus cordis, affecting his breathing. After a temporary amendment, the pain was felt more generally in the site of the right lobe and on the ilium, while on inspiration, it started up towards the centre

of the clavicle, and the tip of the shoulder. For some time, it was found in various situations, as below the right nipple, or at the edge of the ribs to the right of the scrobiculus cordis, coming in stitches, or being of a dragging nature, and occasionally so severe as to prevent his lying in any position but on his back. At one period, the pain was reported to be confined to a spot, about the size of a rupee, but so intense in degree as to prevent his straining at stool; and from about the 15th day, till the fifth before his death, the uneasy sensation was chiefly referred to the side and chest, impeding his breathing, and at this period preventing his lying on his left side. During the last five days of his existence, no particular reference was made to pain in any situation, and he died eventually, chiefly from affection of the bowels, combined with general debility.

Case No. 24 is a very peculiar one. The patient reported himself on the third day after his illness attracted his attention, and on the 11th from his decease. He complained, on admission, of severe pain in the lower part of the right lobe of the liver, and it was felt along the edge of the ribs on pressure, but he could draw his breath pretty freely, and lie on his right side; having a sensation of a great weight however in turning over to his left. He had no pain in the shoulder. On the 5th day from admission, he was free from any uneasy sensation, excepting that of a feeling of weight at his breast, as if, according to his own account, he had eaten suet, and had a desire

to vomit. On the following day, this sensation was changed to a degree of dyspnœa, imputed to weakness, a feeling of being hot and oppressed, and until two days before his death this feeling is recognized by the expression of "a sense of oppression and clogging in the breast," or "at the stomach," or "across the chest," or "a feeling of a ball at the scrobiculus cordis, which on inspiration is conceived to be passing upwards." During the last two days of his life, his sense of anxiety was attended with general pains in his limbs, and a sensation of deadness or coldness in them, which caused him to scream.

The case of No. 25 is also peculiar, and as its progress elucidates some of my observations on the various and insidious forms of disease which appear to be induced by the presence of an abscess of the liver, and the length of time which may elapse from the first symptoms of these disorders till the death of the patient, I shall detail its history a little more minutely than I have done any of the above. In doing so, I may remark, that my considering some of the symptoms as indicative of an abscess then existing in the liver, originates in my observing peculiarities attending them, which considerable experience in the diseases simulated, leads me to think, very seldom accompany idiopathic attacks of a like nature. The patient was a stout man, having a florid complexion, light-red hair, and light-blue eyes. In April, 1828, he had an attack of jaundice, but from thence appears to have enjoyed

good health until September, 1830, when he was seized with a severe pain at the scrobiculus cordis, accompanied by retching. These complaints were removed by 30 leeches and a purgative, but the prominent symptoms putting on those of a quotidian remittent, were afterwards checked by the Quinine. The chief peculiarities attending the fever were, there being no head-ache; pulse, in all stages, small and contracted; a degree of yellow tinge in the eye, and urine, being observable for several days after the third day from admission, and then gradually leaving him; nausea, a highly furred tongue, and the pulse continuing frequent for a day or two after the tendency to exacerbations of fever had ceased. He returned to hospital in 34 days with another attack of fever, of much the same description, but no pain is reported at the scrobiculus cordis. He was next admitted in 12 days from his previous discharge, then in 37 days, and again in 16 days, the symptoms of all which attacks were very similar to the above, and the duration of the patient's stay in hospital each time being from six to nine days. In the last attack, he had the peculiar symptom of a gland in the right axilla, becoming tumefied. In all these attacks of illness, with one exception, his urine was very high-coloured, and his eyes yellow; there having been no case of simple paroxysmal fever, among 5 or 600 witnessed by me in the last two years at this station, which presented a similar symptom. He was again reported sick in 40 days, having had an attack of shivering, followed by fever, which was present

in some degree on his admission into hospital. On this occasion he had no exacerbation, his chief symptoms being a tendency to vomit, particularly when lying on his back, and some yellow suffusion of his eyes. These were removed in about a week, on his mouth getting considerably affected by mercury, and during 12 days further in which he remained in hospital, he only complained of the affection of the mouth, weakness, and want of appetite, and there was occasional frequency of the pulse, with a tendency to constipation. He returned to hospital in six days, when the report is as follows: "Says he was purged yesterday, having four stools in the day, and three last night, without any pain, and stools are reported natural, but his eyes have been observed to get a little more yellow for two or three days, and his urine is quite red. Pulse is 96, contracted; skin of natural temperature and dry; appetite indifferent; tongue a little foul; no vomiting." By a purgative and tonics, the prominent symptoms were soon removed, the pulse coming down to the natural standard in two days, but after a week's continuance at that range, it was suddenly found in the morning again at 96, it gradually became lower, and he went to his duty in two days afterwards. In 25 days, he had an attack of frequency of pulse, with fever, much of the same description as on the preceding admission into hospital, but the bowels were not affected. There was an apparent tertian tendency in the accession of a slight degree of fever for two intervals during the attack,

but he was considered well on the seventh day from his admission, and went to his duty. He did not return to hospital for three months and a half, when the case proved fatal 43 days afterwards. Upon this attack, the prominent symptoms on admission were of a dysenteric nature, the stools being either of blood and slime, or loose and of a green or a bilious brown hue, and attended with great straining; but no pain was felt in pressing any part of his belly. He had also occasional nausea, and the pulse ranged from 96 to 100. With the exception of two occasions, he made no mention of any pain throughout the illness referrible immediately to the abscess. On the 4th day from admission, he alluded to pain at the scrobiculus cordis; and again on the 31st day, is stated to have a general uneasiness or pain from the same spot towards the navel, increased on pressure. For some time, the only symptoms were slight looseness, a feeling of weakness, great want of sleep, loss of appetite, and the eyes were slightly yellow. By the 23rd day, however, his bowels had got pretty regular in the number of stools, but he continued, without complaining of any thing in particular, to get more weak, exhausted, and emaciated; his eyes and countenance became more sallow, he had upon one occasion an attack of shivering followed by sweating, and his pulse became oppressed, small, and more rapid. His stools also began again to be increased in frequency, and without any pain, or vomiting; his easiest position was generally on his back, with his chest raised: he gradually sunk and died.

Case No. 27 is a great contrast to the preceding, as respects the indication of the disease by pain. From a month after his arrival in India, till 16 months before his death, he had been seven times in hospital, the diseases being reported fever, diarrhœa, and dysentery, and each of these attacks presented some peculiarities, which, however, are not sufficiently marked to be worthy of being taken notice of at present. At the latter period, when in hospital with one of the above attacks, he first reported a pain being felt in the right side from the ribs to the ilium, increased on the least pressure. This was removed by leeches.—About four months afterwards, this pain is again taken notice of, when admitted into hospital apparently suffering from the effects of drinking; and at this time, it was again removed by a repeated application of leeches with purgatives. The seat of the uneasinesss was upon this occasion more in the site of the head of the colon, but he complained also when in hospital of a pain being felt at the back of his right shoulder. He was re-admitted in a month afterwards, when he stated that he had been affected with more or less of a pain about the edge of the false ribs, since his last discharge from hospital, and had occasionally a pain in the right shoulder. He, at this time, had also a cutting across his bowels, and looseness, with tenesmus, the stools being feculent, loose, and scanty, with a little blood. He was, on this admission, 72 days in hospital, in the course of which, the case presented a variety of all the leading indications of an

abscess in the liver, none of them however proceeding to great severity. The most common complaint was the pain, which was at first felt in the above spot, but latterly more towards the spine, and it continued to be mentioned at times till his discharge from hospital. This pain sometimes alternated with one in the shoulder, or both being present at the same period, the latter continued when the other was not felt, and was occasionally referred to the inferior angle of the scapula, or across the shoulder, or down the right arm, with a feeling of weakness in the limb. There was also, at first, a tendency to looseness, with a griping across the belly ; but this changed latterly to an indolent state of the bowels, and purgatives were often required to procure evacuations. The patient had likewise a few attacks of a febrile nature, with some appearance of rigors ; but the pulse, excepting being small, was in general very little affected. His mouth was upon this occasion affected by the mercury to ptyalism. He did not return to hospital after his discharge at this time, for four months, when he became affected with a dysenteric disorder, which presented the symptoms often observed in similar cases. He occasionally complained in the course of this attack of griping pains in his belly, and once of an uneasiness at the scrobiculus cordis, but the immediate indications of diseased liver were not very prominent. His mouth was also affected to ptyalism, on this occasion, and he left the hospital in 14 days. He was however in a week seized with all the symptoms of Cholera, when in attendance upon a patient la-

bouring under that disease; but although the evacuations were quite clear, and watery, there was no great tendency to sinking. He complained, however, on the fifth day afterwards, of a great pain about the lower false ribs, on the right side, and from this period until his discharge from hospital, 50 days from his admission, the pain of his side was nearly constantly present, in greater or less severity, at one period checking his breath, he said, like the sharp cutting of a knife, and at another less acute; having at times, also, some uneasiness about the scrobiculus cordis, but in general, with little disorder of the bowels, or constitutional affection. He was sent out on the convalescent list, but returned with the fatal attack in 27 days; dying in 28 afterwards. The most prominent symptom, then, was the pain of side, which scarcely ever left him till his decease. This was at first situated among the false ribs, then more generally over the right lobe of the liver, and latterly, it was felt most severely for about two inches below the ribs, where the liver was protruded by the size of the abscess, and presented a hardness gradually sloping, and extending towards the navel. There was also occasionally pain of the shoulder, and the progress of the disease was further shown in the patient being at first unable to lie on his right side, then on either side, and at last he could lie in no position, but on his back.

The last case, No. 28, where the solitary abscess was in the right lobe of the liver, shows also a pecu-

liarity in its symptoms, differing in some degree from any of the above. About three months before his death, the patient first complained of a pain, which he described as being about the region of the heart, and it was increased by coughing, although not otherwise by respiration. It was removed by a blister, but in six days afterwards, he was seized with a looseness and some degree of fever, and on the following day, complained of a pain in the right shoulder, which had been preceded by a rigor, and in a few hours, this pain increased much in severity, and struck down the side on inspiration. It however began soon to diminish, and with a slight degree of frequency of pulse, he only complained of weakness, want of appetite, and sleep, and vertigo occasionally, till the 17th day after admission. It is then recorded, that in getting up on the previous night, he felt a pain in the right side, in the site of the right lobe of the liver, near the edge of the ribs, which still continued, preventing his lying on the right side, or breathing freely. This was removed in two days, but he began to be affected with occasional rigors, an increased frequency, and contraction of the pulse, and at times, a heat of skin, with a tendency to sweating. He however said he had no complaint, excepting feeling very weak; and he continued making no report of pain, nor indeed was there any prominent symptom of disease about him, excepting the above, until the 29th day after admission, when he had again an attack of pain in the right side, near the edge of the ribs, increased in

drawing up his right arm. This was removed as suddenly as it came on, by a blister, and he had another interval with the same slight symptoms of disease as before, and occasionally a tendency to looseness of the bowels. For about a month previous to his decease, he had no pain in any part of his side, but emaciation and debility increased; and 10 days before his death, he became affected with a severe purging, attended with straining: and the stools were rather copious and watery, partly composed of a feculent matter of a brown hue, and partly of a spinage-coloured mucus with blood. This affection continued on him till his death, being the more immediate cause of that event. On the day following the commencement of this symptom, it is recorded, that since midnight he had been affected with a frequent short cough, at first, he said, seeming to choke him, the sputa being composed of a greyish-looking phlegm, with a good deal of fluid, frothy, bloody matter, which came, he said, into his throat, and was brought up without trouble. For several days, he brought up a large quantity of greyish-looking purulent matter, the cough distressing him much, preventing sleep, and aiding the dysenteric affection in causing his death.

In the three cases, where the abscess was a solitary one situated in the inferior portion of the right lobe of the liver, the symptoms and progress of the disease presented more features of resemblance to each other than where the abscess was higher up in this

organ. In all of these, the symptom of pain was preceded by other indications of the disease, and the progress of these cases, consisted in their becoming debilitated, either by sudden attacks of fever with shivering, or by affections of the stomach and bowels, or without any prominent cause; after which a severe pain was suddenly complained of near the site of the abscess, respectively at 11, 13, and 14 days before the death of the patient. This pain was stated to be either midway between the ribs and ilium, or somewhat higher, impeding respiration, and of a constant nature. In one case, it continued till nearly the fatal termination, but in the others little notice was taken of the pain for several days before this event. The cases were also similar in their duration, none of them showing any prominent symptoms of the disease, more than two months before death, and there was no affection of the shoulder.

In the two instances, where the abscess was situated in the left lobe of the liver, the seat of pain was modified by the site of the disease; but in the attendant symptoms otherwise, there was very little similarity. In the case, No. 13, where the abscess was chiefly towards the concave surface of the liver, and which burst into the cavity of the abdomen in that direction; about 10 weeks before his death, the pain was, for a day or two, referred to the right side, increased on pressure, and extended to the shoulder; and until a fortnight previous to the fatal termination, the symptoms indicated, at one pe-

riod, disease of the right lobe, and at another, the pain was more in the epigastric region, and below the præcordia, sometimes increased, and at others relieved by pressure there, extending to the chest on an inspiration, and aggravated on going to stool. During the last two weeks of the patient's life, however, the uneasy sensation was either a feeling of pain at the scrobiculus cordis, at first only observed upon pressure, then a sense of distention or hardness, with an increase of pain, particularly on pressure, or a stitch, which was easier on sitting up, or walking about, than on lying down; while in taking a long inspiration, he felt his breath caught by the pain near to the right side of the navel. On the eighth day before death, a swelling was observed below the ribs, and a little to the right of the præcordia, being somewhat higher up than the place which had been pointed out as the seat of pain. This was painful to the touch, and the uneasiness was increased in lying over on either side, and diminished on walking about. The pain and swelling increased upon him till three days before his death, when he said he felt something give way, with a little relief to his pain; the swelling became less, and more diffused, and he rapidly died. His symptoms otherwise were occasional exacerbations of fever, severe vomiting, and a degree of diarrhœa, at times, which was in reality the chief symptom on admission. In the other case, No. 26, after a long period of apparently good health in India, the patient was admitted into hospital with symptoms of dysentery, in the course of which he

complained of pain, which was at one time felt below the navel, increased on pressure; he then had pain around the navel, or over the belly, and afterwards, about the head of the colon, extending towards the pubes. He was apparently however well in 11 days from admission, and was discharged from hospital, but in 13 returned, having been suddenly seized with a pain, which was now more distinctly referred to the site of his disease. It continued with little if any remission, for about a month, and was described as being situated, at first, about two inches below the scrobiculus cordis; after some time, it was said to have shifted a little more to the right, and was felt to the right of and above the navel, extending for about two inches below the margin of the ribs. When he first reported himself, he stated, that on lying over to either side, the pain fell over to the most dependent situation, and it was increased on inspiration and pressure at the scrobiculus cordis. After a few days, he could lie on his right side, but not on the left, feeling in turning over to this position, as if something was falling away from the right side. In about three weeks from his admission, however, he could also lie on the left side, although he still felt the pain; he became desponding, saying he thought it would never leave him. From this period, however, the annoyance of the pain began to diminish, and his spirits to get better, but he did not pick up flesh or strength, and he was suddenly, during an epidemic prevalence of Cholera, seized with this disease, which, although subdued, left him in an increased state of debility. He sur-

vived this attack for about three weeks, but never complained of the pain formerly alluded to. He continued without any prominent complaint, excepting some looseness, more or less dysenteric, want of appetite, and sleep ; and, he referred his uneasiness partly to soreness of his mouth from mercury, and partly to an ill-conditioned ulcer, which had taken place from a blister that had been applied. He died, completely exhausted, in 25 days from the attack of Cholera, and 86 from the first admission with Dysentery.

The case No. 8, where there was a large abscess in the centre of the right lobe, and a small one in the left, occurred in a patient who had been 12 years in India at the period of his decease; and, from the designation of the attacks which had brought him into hospital for $2\frac{1}{2}$ years before his death, there appears every reason to suppose, that he was a man addicted to drinking, and subject to affections of the liver. As far as the records show, he had been in hospital twice within three months of his decease, complaining of pain referred either to the scrobiculus cordis, or to the breast. He had not however been on the sick list for about six weeks preceding his last admission, when he was reported with symptoms of fever, and these were treated accordingly for six days. He was then suddenly seized with a pain in the right side, extending to the shoulder on coughing. This was removed on the following day by a blister; but for a week further he complained of a pain at

one time in the left side, then shooting through his bowels, and afterwards about his navel. No particular uneasiness however is recorded in the remaining week of his illness; he sunk from febrile exacerbations, with sweating, and a degree of affection of the bowels.

The five cases, Nos. 4, 7, 17, 18, and 23, which presented on dissection a number of small abscesses in the liver, resembled each other in the shortness of the period taken up from the appearance of the first symptom of disease, till the fatal termination; and, also, in the affection of the bowels. The general progress, likewise, of three of these cases, Nos. 4, 7, and 23, corresponded in a great measure, with the exception, that in the last individual, for two days after his fatal admission into hospital, he complained of pain, at first in the right side, a little below the ribs, increased on pressure; then at the scrobiculus cordis; and afterwards to the left of this, increased by a long inspiration; while in the other two instances, no pain was referred to near the site of the liver throughout the disease. The dysenteric symptoms were in those the more immediate causes of the death of the patient. In No. 17, where the disease was chiefly confined to the left lobe, there was, besides the smaller abscesses there, a large one, extending to the middle lobe, occasioning protrusion of the liver; and the most prominent symptom for a great part of the earlier period of the patient's residence in hospital, was a pain induced by the presence of the latter abscess.

This pain, which was occasionally less, or not perceptible for a few days, and again occurred with great severity, was described as being felt at the scrobiculus cordis, or at two inches below the end of the sternum, and was increased on pressure. At one period, it was stated to be as if the cartilaginous extremity of this bone had been pressed down on the stomach ; at other times, it was felt of a hot burning description, or as a great weight over the stomach ; as if this was full of something, or he suffered from darting pains with intervals of a few minutes of ease. These symptoms were attended with an increase of frequency in the pulse, but particularly with a dysenteric affection of the bowels. The latter was the chief disorder on the patient's reporting himself sick, ten weeks before his death; and, although for part of his sojourn in hospital the bowels were little affected: towards the termination of the case, they again became disordered, and the organic mischief which was found in the colon, on dissection, sufficiently indicates the share this had in producing the fatal event.

The remaining case, No. 18, in which there were numerous abscesses, resembled the others in terminating in a severe dysenteric attack, which carried off the patient in 12 days after admission into hospital. At this period, there was no pain referred to the site of the liver, but the man had been in hospital, previously, for about three weeks, having been admitted there six weeks from his disease, during which time, along with a slight degree of frequency of pulse, he

complained of occasional pains at the epigastrium, extending towards the right hypochondre, or in the latter place only, not increased on pressure, but by inspiration, or lying over on the left side. There appears little doubt that these symptoms were excited by the presence of the abscesses in his liver: and a degree of general disorder of the constitution was further indicated, at the same time, by the vague feelings of uneasiness, which the patient complained of, without being able to refer his disorders to any constant situation. He frequently described his having pain in various parts of the limbs, and along with these there was want of appetite, dislike to exertion, debility, and want of sleep. Under a degree of relief from these symptoms, he was sent out of hospital, and returned with his fatal attack.

The modification of the pain by the position of the patient, will be observed, by the above details, to have varied in a few cases, although the site of the abscess was apparently the same. Frequently the patient said he could lie in any position without annoyance; and in some cases, the uneasiness only extended to a sense of weight, which was found on turning to the left side or other situation. Most generally, however, when the pain in the region of the liver was at all present, it was aggravated by lying over on the right side, apparently from the weight of the body pressing the ribs and contiguous parts on the seat of the disorder. In a few instances, the pain was felt most acutely on turning to the left

side, and in all, the easiest position was on the back, or midway between lying in this posture, and the left side. Towards the termination of the disease, the patient was sometimes observed lying in a position which he had always declared himself unable to accomplish before, while others, previous to death, could only lie on the back without annoyance.

With respect to the pain at the shoulder, it will be observed, that, with the exception of three cases, it was taken notice of at some part of the progress, of all the instances where the abscess was seated in the upper part of the right lobe of the liver, and the exceptions were individuals in whom little pain was complained of in any situation, throughout their diseases. Where the abscess was seated either at the lower margin of the right lobe, or in the left lobe, or where there were numerous abscesses, no pain of the shoulder has been observed.

The large intestines appear peculiarly to sympathise with the state of the liver, and few of the above cases of abscess in this organ, have been unattended with a disordered state of the bowels, in some part of their progress. The degree, however, to which this disorder has extended, the period of the abscess at which it has shown itself, and the permanency which the dysenteric symptoms have exhibited, after they have commenced, have considerably varied. In one class of cases, the patient had been subject for some months or weeks to occasional attacks

of Dysentery, or had been affected severely once with this disease, sometimes accompanied with pain about the liver or abdomen; but as the affection of the liver became more prominent in the latter periods of the complaint, the dysenteric disorder became less conspicuous, and the affection of the bowels was not a very urgent symptom at the death of the patient. Such was the progress in 11* of 26 instances of the disease, and the abscess in all of them, with one exception, where it was situated in the upper part of the left lobe, was found in the upper part of the right lobe. These afforded the most chronic cases, which were met with, and presented the greatest number of admissions into hospital from the appearance of the first symptom of hepatic disease till the fatal termination. The affection of the bowels in these cases is in general seldom of a very acute nature, or with difficulty checked for a time. The stools occasionally only vary from those of health, in being more frequent and loose, than are natural, and they are generally attended with either griping or more frequently tenesmus, or with both of these affections. At times the evacuations are of a muddy greyish hue, or of a pale yellow, or greenish yellow, or a spinagy appearance, indicating, it is to be supposed, deficiencies or vitiation of the bile. In other cases, the dysenteric disorder became more marked, the evacuations were streaked with blood, or had some blood or mucus upon their surface; or

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* Nos. 9, 10, 11, 14, 15, 16, 19, 20, 25, 26, and 27.

if the disease proceeded to a greater degree, they became more frequent, and were composed entirely of blood or slime, attended with pain of the belly and other symptoms of acute dysentery. In one case, as has been mentioned, there was a separation of about five inches of the inner coat of the intestine. These attacks are, although occasionally distinguished by their tendency to continue upon the patient, more remarkable, like some other symptoms in the progress of an abscess in the liver, by their disposition to relapse, the irregularities in their degrees of severity, and the slight, and apparently disproportionate means, by which they occasionally become ameliorated. In six* other cases, the affection of the bowels did not become prominent, until nearly the death of the patient; when it presented, in the various periods of its progress, the same features as the above, increasing in some instances towards the fatal termination, and in others becoming less urgent as the patient sunk.

In another description of cases, the fatal termination has evidently been accelerated, if not immediately produced, by the severity of the dysenteric affection. This has been observed in seven† cases, in two of which the abscess was a solitary one in the right lobe of the liver, and the remaining five comprised all the cases which presented numerous ab-

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* Nos. 5, 6, 8, 12, 13, and 21.

† Nos. 4, 7, 17, 18, 22, 23, and 28.

scesses in that viscus. The dysenteric disorder in these individuals presented little else in its appearance beyond an aggravation of the symptoms mentioned under the last description of cases. The stools were more frequent in number, often exhibited large masses of coagulated blood, and latterly became little else than a brown watery and reddish liquid, which was occasionally of a highly fœtid smell. The pains which have in some instances been referred to the site of the liver, on the patients' admission into hospital, have disappeared for some time previous to the fatal termination, but there has been great annoyance from the excessive straining, and pain at the anus, and in one of the cases, some degree of prolapse of the rectum was experienced.

In the remaining two* cases, both of which quickly ran their course, there was little affection of the bowels. The stools were more frequent than is natural, loose, and of an unhealthy colour, chiefly of a dark greenish, or greyish green hue, but these appearances were by no means of a conspicuous nature, and may be attributed, in some measure, to the treatment which was employed.

The constitutional disorder attendant upon these cases is undoubtedly to be considered as a pure hectic fever, which varies in little or no degree from that described by the most experienced writers in

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* Nos. 3 and 24.

Europe, as attendant on purulent collections situated in similar circumstances with those which form the subject of this paper. In a few instances the symptoms of hectic have been extremely mild for some time, or have been unattended with frequency of pulse, or heat of skin, the only indications of general disorder being the low exhausted state of the patient, some irritability of the pulse, want of appetite or sleep, and an increasing emaciation. In other cases again, by causes of excitement, or other means, a degree of synochal fever appears to become connected with the hectic, a circumstance, which is often found on the admission of the patient into hospital, requiring active measures for his relief, but, as may be inferred, having no effect in the prevention of an abscess, this being already formed. In a few instances, these affections have put on more the features of a continued fever, similar to that of irritation, the pulse continuing small and frequent for a few days ; at some particular period, with little appearance of exacerbation or remission. The constitutional disorder, however, in general assumes the aspect of a paroxysmal fever. Under this form, the febrile accessions have been found to occur in some instances with a sudden attack of shivering, vomiting, and purging, and the symptoms diminished gradually, in a day or two, the patient being left, comparatively speaking, free from fever, the pulse gradually declining to the rate at which it had been previous to the febrile paroxym. These accessions occur at intervals of various duration, and often put on the

appearance of relapses of common intermittent or remittent fever. At other periods, such exacerbations are less marked, the chief symptoms being rigors occuring at irregular intervals, generally with some increase of frequency of the pulse, and alternating with sweatings, which have been usually remarked at some period of the night. These sweatings have been in some individuals excessive, the perspiration being stated to be pouring off them like rain, and in one or two instances of this description, there has been considerable sinking of the vis vitæ at the same time.

In the more chronic cases, however, the most usual description of hectic consisted in a degree of fever, evidenced by an increased frequency of the pulse, at some period of the afternoon or evening, with heat of skin, and this was also observed occasionally to have terminated in perspiration. These daily paroxysms were at times broken in upon by either of the forms of hectic above-mentioned, while upon other occasions, after ceasing to be manifested for several days, they were again observed. Under all these forms of hectic, the pulse is very generally recorded as weak or thready, or irritable, very seldom having a full soft feel ; and having a daily or other range, according to the state of the fever. At the same time, as the disease proceeded to its fatal termination, there was a greater general frequency of the pulse, subject to be occasionally further increased on the accession of the hectic paroxysms. There was a great diversity however in the degree of frequency of the

pulse in each individual; in some there being little general acceleration for a long period of the disease, while with others, it ranged constantly above a hundred for some weeks previous to the patient's death. The pulse has also been observed to be irregular, at times, in the progress of some of the cases.

Along with the attacks of hectic, the countenance of the individual generally loses its florid aspect, becoming either of a pallid, leucophlegmatic or sallow hue. In one case, it has been mentioned, that the patient became somewhat jaundiced with almost every accession of fever; and, in No. 8, there was an affection of a like nature from the fourth day preceding the disease.

Debility and emaciation succeed according to the length to which the disease is extended, and in a few instances, where this has been of some duration, these symptoms have eventually been very conspicuous, and œdema of the legs and right arm has been met with. Allusion has been made in the detail of some of the cases to the external manifestation of the abscess by swellings near to the site of the disease. This in one case was produced by the advance of the abscess itself through the ribs, but in general it appears to have been an indirect effect of the collection of purulent matter, either inducing protrusion of the liver beyond the ribs, with occasionally some distention of the lower part of the right side of the chest, or where the abscess has

been deeply seated towards the centre or left lobe of the liver, the swelling has been from the pressure of the abscess on the contiguous abdominal viscera, in its tendency towards the surface of the body.

Vomiting has been a frequent attendant on this disease, and its occurrence at occasional intervals, where it cannot be referred to the medicines employed, or the state of fever, gives often reason to suspect an abscess in the liver, when the other symptoms do not particularly indicate that disorder to have taken place. It will be observed from a column in Table No. 2, that it was present at some period of the disease in all the 26 cases, with the exception of seven; and from its frequent occurrence, and its non-appearance not being referrible to the site of the abscess, I am inclined to consider it as a symptom, depending generally on the constitutional affection. The state of the tongue corresponds in a great measure, with the degree of constitutional disorder, being on admission usually furred, or occasionally loaded, but in the course of a long-continued disease, getting generally pretty clean, or remaining only slightly foul, till the death of the patient. Under more acute symptoms, however, the tongue becomes foul, furred, florid, or dry, and has been observed in one or two instances loaded with a coat of brown fur. The latter appearances have been attended with a corresponding degree of thirst, and this is generally in all cases urgent towards the termination of the disease. The appetite for food

also depends considerably on the degree of the constitutional symptoms, in the milder affections being only deficient, or capricious, while in the more severe cases it is entirely lost. Cough has been seldom remarked as a very conspicuous symptom, excepting in those cases where the abscess has penetrated the lungs; in these, along with hawking, it was very distressing to the patient.

In the animal functions, it is to be remarked, that in some instances, that peculiar symptom which is taken notice of in the hectic of pulmonary pthisis, the cheerful hope which illuminates every hour of the patient, was particularly conspicuous, as in Nos. 14, 19, 25, and 28, where at the time, the progress of the disease was slow, and the severity of the uneasy sensations, by no means urgent. In other individuals, however, there was little of this cheerful hope, some of them being in reality desponding; and the mental tendency may in a considerable degree depend, I imagine, upon the constitutional peculiarity of the patient. There occurred, in one or two cases, a degree of delirium, or wandering of the intellects for several nights before the fatal termination, but in general the senses were perfect when this event took place. Want of sleep, occasionally from the restlessness of fever, or other causes, but generally where the patient could assign no reason for its occurrence, was a very common symptom, and combined with other appearances, is to be considered, I am inclined to think, as an important

diagnostic. I have alluded above, under case No. 20, to the patient having died of convulsions. He had been gradually getting more weak and emaciated from the discharge of purulent matter, an incision having been made into the abscess, when on the 27th October, 10 days before his death, he became seized with a convulsive shaking of the right side, continuing for a quarter of an hour, and leaving a feeling of great soreness in the parts which had been affected. These spasms were of a tonic description, affecting chiefly the right side of the body, but afterwards, also the lower extremities, and their accession was preceded by a pain striking up to the head; and, he was left much exhausted in their cessation. They recurred in the afternoon of the 29th, from noon till 8 P. M. of the 30th October; again at 3 P. M. of the 2nd November, and severely on the 3rd, and till noon of the 4th. The ulcer on his side increased very much in size at the same time, and by the exhaustion produced, without any further fits, he died on the evening of the 6th.

Such are the chief features of the 26 cases of abscess in the liver, which I have attempted to analyze. I am afraid that, from the number and variety of the symptoms and facts of the cases, I have not been very successful in placing them so conspicuously, or connectedly as might be wished; and I am sensible, also, that some of the inferences I wish to draw from them may be otherwise explained, or may be conceived to be founded on an insufficient number of

facts. These points, however, I leave to be decided by the sense of the members of the Society, and will conclude this paper, by stating what my own opinions are, at the present moment, respecting these abscesses of the liver, believing that some of them will be borne out by the progress of the above cases, and trusting, that further experience may confirm the remainder.

The cases alluded to being the whole of those which have occurred in a certain number of men, under apparently no peculiarity of circumstances, within a period extending to nearly four years, may be considered, I imagine, to afford a view of the usual features of inflammation of the liver, when this disease proves fatal. It will be perceived, I think, that in all, or nearly all these cases, there was evidence of some disorder of the liver having existed for some time previous to the appearance of any acute inflammation in this organ; and that in some instances, a collection of purulent matter was discovered there on dissection, when the symptoms of inflammation had either not been observed, or were not noticed until within a very short period of the dissolution of the patient. There appears to me, therefore, ground for supposing, that the liver, like the lungs, is subject to an insidious degree of inflammation, whereby pus becomes gradually formed within its structure; and that as the collection of matter increases, the disease becomes developed under different aspects, as in the above cases, varying in each

individual from constitutional peculiarity, the site of the abscess, or other circumstances, and differing in its symptoms and appearances from pulmonary pthisis by reason of the difference of structure, and the viscera contiguous to each organ; climate also, as inducing idiopathic affections similar to those resulting from an abscess in the liver, may also have some effect in producing some peculiar symptoms of this disease. There appears also reason to think, that this insidious disease is of a scrofulous nature. Those who have fallen victims to it, as has been above mentioned, have, for the most part, had a scrofulous appearance; the first indications of the disorder have been most generally manifested in the wet or cold season, while they appear to have been benefitted by the hot weather; and I have reason to think, that there is a greater tendency to this affection when the soldier is labouring under the weakening effect of depressing passions, and change of life, incidental to arrival in this country late in life; and more liable to affect Europeans soon after landing at a further period of their sojourn in India.

Inflammation of the liver has long been distinguished into the acute and chronic hepatitis; and there is reason for a distinction in the inflammatory diseases of this organ, although, not from being, I am inclined to think, more or less attended with inflammatory symptoms, as has been generally understood by these terms of chronic and acute, but, inasmuch as one is an acute inflammation, occurring most pro-

bably in the peritoneal covering of the liver, and having a tendency to terminate in resolution or adhesion, while the other is only an occasional aggravation of a disease which has existed for some time, most probably in the parenchyma of this viscus, and which may continue its progress after the more inflammatory symptoms have been subdued. The latter, in short, is the disease under which inflammation of the liver most usually proves fatal, and is that which, under its different aspects, appears to have affected the greater number of the cases above described.

In the treatment of each of these varieties of disease of the liver, it would appear useful to recollect the above distinction, even, where the inflammatory symptoms of each seemed of equal severity. In the first, antiphlogistic measures may be used to their fullest extent with benefit, and, with these, the affection of the mouth by mercury to ptyalism will remove the disease. In the latter, indicated, either by previous bad health, the constitution of the patient, or symptoms such as have been described to have attended the above cases, it would seem advisable to bear in mind the necessity of reducing the strength as little as possible; and, the propriety of exhibition of mercury, which in few cases excites a free salivation, may be questionable. The analogous case of pthisis pulmonalis ought, I think, to be held in view, particularly in the more chronic cases of this hepatic disorder; and the indications for the treatment, ge-

nerally, should be, in the first place, attention to urgent symptoms; and, secondly, to change the tendency to the formation of purulent matter, and to induce an absorption of that already formed, by diminishing the hectic fever, and strengthening the patient's constitution. This, I imagine, is not to be done by means of medicine, although the quinine has been found serviceable in both these respects; but chiefly by the gradual aid of change of air and scene, gentle exercise, and a sea voyage, with peculiar attention to the use of a mild, nourishing, slightly stimulating diet, such as is recommended to consumptive individuals, or those suffering from hectic fever, produced by causes similar to an abscess of the liver.

Kamptee, 28*th April*, 1832.

TABLE No. I.

	Names.	English.	Irish.	Profession in Europe.	Age on Ar. in India.	No. of years in India at Death.	First apparent indication of Hepatic disease.	How long first recorded symptom from arrival.	What month first symptom appeared.	How long from first symptom till death.	How many times in hospital under last heading.	How many days in hospital, under last heading.	Name of fatal attack.	No. of days in Hos. under fatal attack.	In what month died.	In what year died.
1	J. Bloomley,	1	...	Bricklr.	21	1½	Dysentery, ...	17 months,	June,	56 days,	Once, ...	14	Liver†, ...	30	Aug.	1828
2	F. Harris,...	1	...	Tailor,...	22	1½	Liver (registered*),	17 months,	June,	56 days,	...	...	Liver†, ...	56	Aug.	1828
3	M. Smith,...	...	1	Weaver,	22	1	Pain of shoulder and side,	11 months,	Aug.	8 days,	...	...	Liver†, ...	8	Aug.	1828
4	J. Sullivan,	...	1	Labourer	20	1	Dysentery, ...	10 months,	July,	55 days,	Once, ...	19	Dysentery, ...	12	Aug.	1828
5	H. McGuire,	...	1	Ditto, ...	20	1	Hectic fever, &c.	22 months,	July,	40 days,	...	...	Fever contd. ...	40	Sept.	1828
6	P. M'Carthy,	...	1	Ditto, ...	24	2	Dysentery, ...	7 months,	March,	18 mths.	6 times,	185	Liver†, ...	11	Sept.	1828
7	J. Horme,...	1	...	Ditto, ...	25	7	Hectic fever, ...	7 years,	Sept.	24 days,	Once, ...	7	Debility, ...	14	Oct.	1828
8	P. Crouley,	...	1	Ditto, ...	23	12	Hepatitis, (registered*,)	10 years,	Jan.	2 years,	13 times,	130	Fever Inter. ...	20	Jan.	1829
9	T. Galvin,...	...	1	Ditto, ...	20	2	Dysentery & fever,	2 years,	Jan. ...	80 days,	3 times,	20	Liver†, ...	8	March,	1829
0	T. Craddock,	1	...	Ditto, ...	26	2½	Dysentery, ...	5 months,	June,	2 years,	8 times,	81	Hepatic disease,	19	June,	1829
1	J. Lyons, ...	...	1	Ditto, ...	27	2½	Dysentery, ...	20 months,	Aug.	10 mths.	4 times,	121	Hepatic disease,	15	June,	1829
2	P. Brophy,	...	1	Ditto, ...	26	1	Oppression at the breast and fever,	8½ months,	June,	48 days,	...	...	Fever contd. ...	44	July,	1829
3	B. Asquoth,	1	...	Ditto, ...	20	2	Pain of epigastrium,	15 months,	Dec.	8 mths.	5 times,	116	Chronic Diarr.	37	July,	1829
4	T. Smith, ...	1	...	Farmer,	23	2	Pain of right hypochondre,	18 months,	April,	4 mths.	...	...	Liver†, ...	118	Aug.	1829
5	W. Clarke,	1	...	Servant,	20	3	Dysentery, ...	18 months,	June,	17½ mths.	6 times,	145	Hepatic disease,	90	Nov.	1829

* Of these two cases, there is no record of the earlier symptoms, and the existence of the Hepatic disease can only be inferred therefore, at the period noted, from e designation of the patient's disease in the hospital register.

† The term used by the medical officer then in charge as an English translation of the word Hepatitis.

TABLE No. 1. *(Continued.)*

Names.	English.	Irish.	Profession in Europe.	Age on Ar. in India	No. of years in India at death.	First apparent indication of Hepatic disease.	How long first recorded symptom from arrival.	What month first symptom appeared.	How long from first symptom till death.	How many times in hospital under last heading.	How many days in hospital, under last heading.	Name of fatal attack.	No. of days in hos. under fatal attack.	In what month died.	In what year died.
J. Hoolahan,	...	1	Labourer,	20	½	Dysentery, ...	22 days,	July,	5 mths.	4 times,	37	Chro. Dysentery	80	Dec.	1829
L. Farven,	...	1	Shoemaker,	20	1¼	Dysentery, ...	13 months,	Oct.	70 days,	...	...	Abdom. Inflam.	70	Jan.	1830
J. Bradshaw,	1	...	School-mr.	27	½	Pain of side, ...	5 months,	Nov.	54 days,	Once,	22	Dysentery, ...	12	Jan.	1830
Pat. Moore,	...	1	Labourer,	27	4	Dysentery, ...	3 yrs. 8 ms.	Aug.	56 days,	...	...	Dysentery, ...	56	Oct.	1830
Geo. Lee, ...	1	...	Plumber,	23	4	Slight Dysentery and pain of side,	2½ years,	July,	1½ years,	7 times,	117	Hepatic disease,	88	Nov.	1830
J. Quinlan,	...	1	Cloth dresser,	21	4	Rigors and affection of bowel,	3 years and 10 months,	Nov.	52 days,	Once,	24	Hepatic disease,	12	Jan.	1831
J. Forster,	...	1	Clerk, ...	21	2	Pain in right breast	13 months,	July,	10 mths.	8 times,	111	Hepatic disease,	27	April,	1831
G. Bowman,	1	...	Tailor,.....	20	4½	Attack of fever,...	4½ years,	May,	22 days,	Once,	5	Hepatic disease,	13	May,	1831
Jos. Hughes,	1	...	Black-smith,	20	5	Pain in lower part of right side of the chest,	5 years,	June,	14 days,	...	...	Hepatic disease,	11	June,	1831
Js. Bradshaw,	...	1	Servant, ...	22	4	Pain at the s. c...	3 years,	Sept.	13 mths.	8 times,	74	Dysentery, ...	43	Oct.	1831
Th. Murphy,	...	1	Butcher, ...	28	5	Pain in right lumbar region,	4½ years,	Aug.	87 days,	Once,	11	Abdom. Inflam.	63	Nov.	1831
J. Higham,	1	...	Cottonspinner,	22	3	Pain in right hypochondre,	2 years,	Sept.	16 mths.	5 times,	151	Hepatic disease,	28	Jan.	1832
Th. Hurst,	1	...	Clerk	25	2½	Pain referred to region of the heart,	2 years and 4 months,	Oct.	3 mths.	Twice,	63	Hepatic disease,	10	Jan.	1832

TABLE No. II.

No. in Table.	Site and size of Abscess.	State of the Intestines.	Affection of Intestines.	Whether vomiting.	Whether pain of shoulder.	What prominent symptoms on fatal attack.
1	...	...	...	...	...	No report of these cases in the Hospital Journal.
2	...	...	...	...	...	
3	Large, solitary, in right lobe, near the diaphragm,	Externally vascular, ...	Evacuations unhealthy,	1	1	Pain occasional; fever with weak frequent pulse, and tendency to clammy sweats; vomiting; rapid sinking.
4	Numerous suppurating tubercles,	Much ulceration, and thickening over the large intestines,	Dysenteric, ...	Latterly,	None, ...	No pain of liver; severe dysentery, with irregular exacerbations of fever, and great debility.
5	Large, solitary, and deep seated,	Healthy, ...	Occasionally unhealthy evacuations and diarrhœa,	Occasionally,	None, ...	Pain in side from the ninth day preceding death, then and previously attacks of hectic fever, with increasing debility.
6	Solitary, but not large, on the margin of right lobe, with adhesion to the colon,	Large intestines ulcerated from cœcum to rectum,	Dysenteric latterly,	None, ...	None, ...	Pain in right lumbar region—constitutional disorder with weak pulse, moist skin; increasing debility, &c.
7	Numerous small abscesses,	Colon, and cœcum ulcerated and thickened,	Dysenteric, ...	None, ...	None, ...	No pain of liver; dysenteric symptoms, with increasing weakness.
8	One large abscess in centre of right lobe, and small one in left,	Head of colon beginning to ulcerate,	Stools unhealthy, with latterly a little blood,	Occasionally,	On coughing,	Pain of right hypochondre, and about navel, occasionally for the last 14 days, with accessions of fever, and great perspiration; jaundice on the fourth day before death.
9	Small and solitary, near the posterior part of the liver,	Healthy, ...	None, ...	Frequently,	At admission,	Pain on admission, shooting up from scrobiculus cordis to right shoulder,

TABLE, No. II. (*Continued.*)

No. in Table.	Site and size of Abscess.	State of the Intestines.	Affection of Intestines.	Whether vomiting.	Whether pain of shoulder.	What prominent symptoms on fatal attack.
						soon leaving him; afterwards great perspiration, and sudden sinking.
10	Large, and solitary in the outer and upper part of right lobe,	Slight contraction in the colon,	None, ...	None, ...	1	Pain more or less acute near the last false ribs, at times none; synochal fever, afterwards hectic; want of sleep, and great feeling of weakness.
11	Large and solitary in the upper part of the right lobe,	Contraction of colon,...	Inclined to constipation,	Latterly,	1	Pain rather constant in the site of abscess; hectic fever with evening exacerbations, and a small weak pulse; generally a cool-damp skin; frequent vomiting, and a somewhat rapid sinking immediately before death.
12	Large and solitary, at the inferior margin of the right lobe,	Healthy, ...	Some latterly, with at times a little blood,	None, ...	None, ...	At first vague pains about his breast —then for a long time only a great feeling of weakness; want of appetite, and occasional evening exacerbation of fever, and latterly pain in right lumbar region, with affection of the bowels.
13	Large, and solitary in the left lobe, bursting towards the concave surface, and the	One or two round ulcers in the colon,	At first loose, afterwards irregular, ...	Frequent, especially latterly,	None, ...	At first diarrhœa, with some pyrexia, afterwards occasional pains in the site of disease; evening and other exacer-

	matter diffused in abdomen,					bations of fever, eventually with great sweating, and a swelling observed at the scrobiculus cordis, suddenly getting more diffused, with aggravation of symptoms.
14	Large and solitary, in the upper and outer part of the right lobe, bounded by the ribs,	Contraction near the sigmoid flexure of the colon,	Generally loose, and stools either dysenteric or of a pale yellow hue,	Generally none,	Occasionally,	Occasional attacks of pain of side; affection of bowels with hectic fever, under all varieties; perspirations, and ultimately a gradual sinking.
15	Large and solitary, in the upper part of right lobe, communicating with the lungs,	Healthy, ...	Loose unhealthy evacuations, with at times streaks of blood,	None, ...	At first severe, afterwards none,	Pain of side and shoulder; disorder of bowels; considerable hectic fever, with paroxysms of exacerbation; eventually discharge of matter by cough, and gradual sinking.
16	Large and solitary, in the upper part of right lobe,	Large intestines ulcerated extensively,	Dysenteric, ...	Slightly,	1	Irregular dysenteric affection, with occasional pain in the side and shoulder, accompanied by exacerbations of hectic; generally evening increase of fever; frequent rigors with gradual emaciation and debility.
17	Numerous small abscesses in left lobe, one large extending to middle lobe,	Large intestines ulcerated throughout,	Generally, dysenteric, particularly on admission and near death,	Occasionally,	None, ...	Sudden and irregular accessions of pain below the scorbiculus cordis, with intervals of ease, and general amendment of symptoms, which, besides the pain, were hectic fever and affection of bowels; eventually, the latter was most prominent, with a diffused swelling over the stomach.
18	A few abscesses in both lobes, particularly in upper part	Large intestines ulcerated throughout,	Dysenteric, ...	Nausea and oc-	None, ...	Irregular and occasional pains in side for a short period, with slight feverish

TABLE No. II. *(Continued.)*

No. in Table.	Site and size of Abscess.	State of the Intestines.	Affection of Intestines.	Whether vomiting.	Whether pain of shoulder.	What prominent symptoms on fatal attack.
	of right lobe, ...			casional vomiting,		tendency, want of appetite and debility; then severe dysenteric symptoms and hectic exacerbations.
19	Large and solitary, in the upper and outer surface of right lobe, bounded by the diaphragm,	Slightly diseased, ...	At first dysentery, with separation of gut, afterwards less affection,	Occasionally,	None, ...	At first dysentery, then occasional pain of side, in right lumbar region, with evening and other exacerbations of hectic; gradual emaciation and œdema; sweatings, &c.
20	Solitary, on the outer surface of the right lobe, and penetrating between the ribs to the skin,	Healthy, ...	Occasionally costive, and at times loose with blood,	Occasionally at commencement and near the termination,	1	Severe pain in the site of a swelling in right hypochondre, which was opened and matter discharged; irregular bowels; hectic paroxysms and gradual emaciation, with eventually convulsions, causing death.
21	Large and solitary, in the inferior margin of the right lobe, which extended to and adhered to the colon,	One or two superficial ulcers in the colon, where liver adhered,	At first, simple diarrhœa, latterly dysentery,	Occasionally,	None, ...	Severe pain in right lumbar region; affection of bowels; pyrexia with a frequent thready pulse; deafness, and rapidly increasing debility.
22	Large and solitary, in the upper and posterior part of the right lobe,	Head of colon and rectum ulcerated and thickened,	Generally dysentery, particularly towards death, with great tenesmus,	Occasionally,	Severely,	Pain at first severe, in various parts of the right side; affection of bowels; rigors; hectic paroxysms and occasional sweatings, and eventually the affection of bowels being the chief disorder.

23	Numerous small abscesses, particularly in right lobe, and a large one between the two lobes,	Cœcum and head of colon with ulcers internally, and the same in the rectum,	Dysentery. ...	Occasionally,	None, ...	At first pain at the scrobiculus cordis and right hypochondre, with the bowel affection; latterly, chiefly the dysenteric disorder, with thirst, furred tongue, cool-damp skin, gradual acceleration of pulse, and exhaustion.
24	Large and solitary, in the upper, and posterior part of the right lobe,	Healthy, ...	Slight irregularity,...	Frequently,	None, ...	On admission, pain in site of right lobe of liver, afterwards chiefly anxiety and oppression at the scrobiculus cordis, with great perspiration, thirst, vague pains about the limbs, and restlessness, like a patient with Cholera.
25	Large and solitary, in the upper part of the right lobe, half an inch from the surface,	Some superficial ulcerations in the interior of the colon, with slight contraction,	Generally looseness, with more or less of dysenteric symptoms,	Occasionally,	None, ...	Generally no pain, only alluded to twice; long continued affection of bowels; slight yellowness of eyes; irregular hectic sweating, and gradual emaciation and debility.
26	Large and solitary, in the upper part of the left lobe,	Some large ulcers in the head of colon; thickening and contraction of arch and ulceration in rectum,	Looseness with some blood, chiefly in latter parts of the disease,	None, ...	None, ...	A steady pain for a long time, about two inches below the scrobiculus cordis; then continued weakness, sweatings, increase of frequency and smallness of pulse; an attack like Cholera, and very gradual exhaustion till his death.
27	Large and solitary, chiefly in the upper and outer part, but extending nearly over the whole right lobe,	Colon rather contracted; inner surface red and corrugated; no ulceration,	Looseness generally, with sometimes a little blood and mucus,	Frequently,	Severely at times,	Pain in site of abscess; affection of bowels; occasional hectic exacerbations, and gradual emaciation with debility.

TABLE No. II. *(Continued.)*

No. in Table.	Site and size of Abscess.	State of the Intestines.	Affection of Intestines.	Whether vomiting.	Whether pain of shoulder.	What prominent symptoms on fatal attack.
28	At period of dissection small, solitary, at the posterior and upper part of the right lobe, penetrating the right crus of the diaphragm and lungs,	Numerous ulcers, running transversely in the interior of the colon. which was not thickened, ...	Dysentery, ...	None, ...	At the commencement occasionally, ...	For two months, occasional pain in right hypochondre, with rigors, perspirations, frequency of pulse, loss of appetite, want of sleep, and gradual emaciation; then severe dysenteric symptoms, and for 10 days expectoration of purulent matter.

ON

THE CLIMATE OF CANTON,

AS A RESOURCE FOR

INVALIDS FROM INDIA.

By A. PEARSON, M. D.

Presented 2nd February, 1832.

I GREATLY regret the having been so long prevented from replying to your letter* of June 4th, 1831, and the queries which in it you transmitted to me, on the subject of climate in this part of China, viewed as a resource for the recovery of invalids from India.

In addition to other points of inability for doing justice to the inquiry, I ought to premise one arising from my own opinions, the impression being that of doubt respecting the beneficial efficacy of change of climate, in many of the states of disease or of impaired health, in which it is frequently

* The observations contained in this paper are in reply to a letter from Mr. Twining.

prescribed, or beyond a few cases in which it has, in all ages, been resorted to as a sanative measure. A removal from an atmosphere contaminated by exhalations from the soil, paludal, or others, is obviously required, and in no other case is the benefit of change so unequivocal in itself, or in aid of other remedial means:—with diminished expectation of beneficial results, such a change is a justifiable expedient in pulmonary affections, especially, if not exclusively so, in the incipient or early stage of such affections, and where a removal is practicable from a bleak and mutable climate to one of mild temperature, and also of limited variation as to its range. Change from residence in a tropical climate to one of colder and more invigorating temperature may have good effects in certain descriptions of stomach, hepatic, asthenic, or sexual ailment; and the combined influence of sea-voyage with such climate will prove favourable in some descriptions and stages of fluxes. Still even in such, allowance being made for what might be effected by suitable treatment and regimen on the spot which it is meditated to quit; with abatement for the inconveniences, expence, discomfort, and abruption from duties, which removal implies, and where established malady in the cases supposed is superadded; it is to be feared that the chance of actual benefit to accrue, would be too dearly purchased.

There is a numerous division of invalids who seek relief from change of climate, belonging to none of

the classes adverted to ; those of nervous temperament, and that more or less combined with the various feelings and sufferings of hypochondriasis. The relief and excitement derived from the act of change are probably with such the beneficial influences they are in quest of, more than such as are derivable from any climate however benign or salubrious. With such, habit comes at length to constitute the impatience of place and desire of mutation, a malady in itself, one too having its physical characters, and accompanied by disordered functions, but in which it may be doubted whether it is consistent with duty towards the individual to concede to ; in an especial manner where the professional man referred to is also responsible to a public service for an opinion entailing expence upon, and impairing the efficiency of it by affording his sanction.

When it is considered, that of the only two points within the confines of China which are accessible to Europeans, one is just within and the other upon the border of the tropics, and that Canton is in the same parallel of latitude with Calcutta ; its having been deemed a suitable resort for invalids labouring under ailments which have originated in similar situations, may surprise. Before entering into detail, the circumstances which, it is probable, have conveyed the impression of a superior salubrity of climate, require being adverted to ;—they resolve themselves into the temperature being lower, and that in more months of the year than is the case in parts of India

similarly situated, and in the more completely cleared and cultivated state of the surface of the country.

The greater proportional degree of cold pervading this continent has been frequently noticed:—in Pekin, situated in the 40th degree of N. Lat. according to the meteorological reports of the Missionaries the river is usually frozen over during several weeks of each year, and the average temperature of the three winter months is not, or but little, higher than that of Edinburgh or Dublin, during the corresponding period.

The cultivation of the country, according to a well known general law, has had the effect of diminishing and correcting the morbific influence upon the frame of the exhalations from its surface, although sickness from that source continues to be general, as well in the acute and defined forms of disease, as in those of chronic and often anomalous character, which elsewhere proceed from such remote causes.

Of the two cities in China, Macao and Canton, to which only it is permitted to foreigners to resort, the former is unquestionably the most salubrious. It is situated in N. Lat. 22° 10′; E. Long. 113° 32′, in the noble estuary, into which the river of Canton falls; and as well as the many islands with which that is studded, it is formed of granite. It is itself part of a large island, connected with it by a narrow

neck of land, across which the Chinese have built a wall, in the centre of which is a gate with a guard-house over it, thus forming a barrier which foreigners are prohibited to pass. This allotted space may be eight miles in circumference, and contains a population under the Portuguese Government of about 4,500 souls, (a census taken in 1822 gave 4,315.) The Chinese population is much greater, and not to be exactly ascertained, but data had recourse to for the end, make it amount to 40 or 50,000. The advantages of its situation are, the free exposure to sea air, the excellence of the water, and generally a dry bottom, so that though not exempted from the endemic maladies, they prevail in a mitigated degree. The south and seaward side of this peninsula is high land, behind which is a stripe of flat alluvial ground, running from E. to W., a reclaimed swamp, now the only soil upon which rice and vegetables are grown, and which is the only source of paludal miasma within its limits.

Canton is situated 80 miles farther up the river, on its left bank, upon the alluvial land adjoining to it, which in the course of this portion of the river, and of its other branches, is also flat and marshy, under full cultivation chiefly of rice. Beyond and to northward of the city is a line of hills extending from W. N. to E. S. E., in no point nearer than two miles to the river's bank. They afford good water, but that from wells in the town is bad, owing both to the percolation

from the river of the brackish tide-water, and to mineral impregnations from the soil. The part allotted for the abode of foreigners is in the southern suburb, of very limited extent, along and close to the banks of the river, constructed more to contain a number within a small space, than to minister to convenience and ventilation,—the spirit of Chinese institutions being, that they are for temporary abode only, to be annually vacated when the commercial season is over; but as now the resort of foreign ships continues in both monsoons, and throughout the year, the regulation for an annual removal of all foreigners from Canton is practically departed from; the only difference between the two periods being, that during the commercial season (i. e. from September to March) the site of the foreign residences becomes like that of a fair; the place for holding which is most inconveniently limited with reference to the temporary population resorting to it.

The anchorage for foreign ships trading to China is at Wampoa, 9 or 10 miles below Canton, where though there is elevated ground on the right bank of the river at that particular spot, at the bottom of and all round it, is so much occupied by rice grounds, that it may be deemed fully exposed to paludal exhalations, and the diseases occurring from them are prevalent among the ships' companies. The proportional mortality has not generally been great, though of late years more so, and in some ships appalling, especially in those having European crews;

the remainder, of different nations, and the ships in the country trade under the British flag, not having suffered in the same degree, so as to render it probable that the excesses of the men have been more in fault than the situation, or at least have greatly aggravated the diseases to which that predisposes.

These observations being accompanied by meteorological abstracts for two different periods of three years each, viz. 1809, 10, and 11; and 1829, 30, and 31; reference to them will afford details respecting the climate of Macao and Canton, which obviate the necessity of farther considering the question of temperature and weather, otherwise than by a general view bearing upon their medical relations.

The monsoons of course mark the great division of seasons, and the northerly one has most reference to the queries before me, as what there is of superior salubrity in this quarter, is expected, and I may add, only to be looked for, during it.

In October, and usually in the early part of that month, northerly winds with cool weather prevail for a few days, in the greater number returning to and blowing from southerly points, when the heat is much increased; and under such changes, variations of 15 or 20° in the 24 hours are usual, and greater ones by no means rare, the atmosphere being clear and the air dry.

Such may be stated to be also the character of the climate during the two succeeding months of November and December, changes of wind from the northerly points being of shorter duration as the season advances into winter; and when that sets in, early in the northern parts of the empire, there are occasionally very bleak days with storms of wind and rain.

From the middle of December to the end of February, the weather is more regularly and steadily cold or cool, and this period is probably the most salubrious, and certainly to European feelings, the most agreeable in the course of the year. It then freezes occasionally, but rarely, and in the night only, not oftener on an average than twice or thrice in the season.

Throughout March, the temperature may be stated to be nearly the same, and often bleak: the sky is clouded, and occasionally much rain falls during that month. Although there is some advance of temperature, the same may be said of April; and during both months, on the wind veering southerly, bringing up much moisture into contact with the cooled earth, there are thick fogs, and much humidity is suspended in the atmosphere occasionally that is close and sultry, more frequently so towards the latter end of the month: and such continues to be the state in May, with a marked advance in temperature, but still cool until towards the middle of the month, when its advance becomes quick.

With June, the hot-weather commences, and continues during the whole of that and the three succeeding months ;—heavy rains often fall in the months of August and September, in the latter half of the last of which the nights become cool. The heat of this period seldom rises above 90° F., but often approaches that, and sometimes exceeds it by 2 or 3°, without that alleviation from regular land and sea breezes, which similar or more strictly tropical climates enjoy. Respecting the state of the winds, their principal regulation is, of course, by the monsoons, the laws of which they obey generally, but with considerable variation of intermediate points, especially at Macao, as is usual on sea-coasts. The N. E. monsoon frequently draws more to the eastward than that, when it blows harder, and gales are frequent, the more severe, the more the wind approaches the E. point ; and that direction of it exerts every unpleasant and insalubrious influence which is every where else complained of from it, especially on the valetudinary, and those who have suffered from intermittents.

The regularity of the monsoon varies much in different seasons generally, and more so in the two first and two last months of its prevalence. Changes to the southward are frequent, of which great vicissitudes of temperature are a necessary consequence. It may be generally stated, that the seasons in which there are fewest of such changes are the most salubrious, and those winters in which there is much

southerly wind, especially from the E. S. E. are the most unfavourable to health.

During the succeeding monsoon ranging from S. E. to S. W. whenever the wind veers to westward of the last point, or becomes westerly, from its reaching after having passed large tracts of country, it becomes a hot wind, and such a direction of it is frequent during the whole summer months, most so in June and July, and in a perfectly regular season, such westerly winds more rarely occur after the middle of the latter month. Previously to the regular period for the change of this monsoon, the wind occasionally shifts to the N. W. blowing from and over a continent thoroughly heated by the preceding summer; it then becomes oppressively hot, and the air remarkably dry. It is from this quarter, and usually after a frequent recurrence of such weather, that the hurricanes known by the name of Typhoons commence, passing from thence easterly round the compass, usually attaining their utmost violence, immediately after passing to the eastward of north, and subsiding when the wind reaches at all to W. of the S. point. They occur most frequently in August and September, although occasionally, they have been known to happen in June, and so late as October; nor are they regular as to frequency, a succession of seasons (especially of wet ones), passing without their occurrence, and at other times, during or after dry and hot summers, they happen repeatedly in one year.

I shall next take a general view of the diseases most prevalent here, and after what has been stated, it is unnecesssary to add that they are those of tropical and juxta-tropical climates.

Such a sketch may commence with the autumnal period, as being that which originates the severest maladies, and in which the human constitution is most disposed to take on disease, and least able by its own efforts to repel or remove it. Diseases connected with paludal exhalations, are the most frequent and general of these, by much most so amongst the ships' companies of the different foreign nations; the marked and prevalent endemic of Canton at the same season, and of Macao also in degree, and that a mitigated one. When occurring in summer, and in autumn, while the heat continues, these approximate more to continued fevers, such as are called Bilious and Remittent; to double Tertians, or Quotidians, having in their exacerbation a hot stage, without preceding rigors. During October, and afterwards, they assume and generally bear the Tertian type, and the Quartan also, though rarely.

The complications adverted to require discrimination at the commencement, and to be met by effectual, but not excessive or exhausting depletion; while the Cinchona may be fully relied on in the treatment, not only in that of regular types, but of those anomalous and diversified forms of disease generated by malaria. The resource of Sulphate of Qui-

nine has much extended the utility and power of application of this valuable remedy, especially so in the less regular forms, and imperfect remissions and intermissions of earlier stages of the malady than the bark used to be deemed admissible in. Still the exhibition of the powder, decoction, and tincture, and with children the extract are (in so far as I have been able to arrive at a conclusive opinion on the subject) equally to be relied upon to effect a cure, and more so towards securing the permanancy of it. It does not come within the plan prescribed for these observations, to consider the various other modes of treatment in diseases of this origin, when definite and regular in their forms: as in few other instances have we curative resources so much to be relied upon, and so invariably successful as in them, proving so beneficial too to the general health, after having answered their end by removal of the malady.

It is the more requisite to be aware of the paludal fevers at this season, being preceded by a period of continued fever, of longer or shorter duration, before assuming their regular type, that there occur during it attacks of simple congestive fevers, and also more serious ones, tending to or resulting from structural injury, and where inaccuracy in diagnosis may lead to peculiarly injurious results. It is to be apprehended, that the tendency of reigning theories, and of the practical views deduced from them, is to promote error by considering the former to be of the character of the latter, and so leading to an excess of

evacuation, especially by blood-letting, the effects of which are to be unfavourably seen during the first cold stage of a paroxysm, when the disease becomes regular. It is not meant to call in question the general principle as applicable to both, but to advert to the difference in degree, when employing the means of satisfying the indications in the two very different cases, both the difficulty and responsibility being enhanced by the similarity of many though not all the symptoms. The great variations of temperature referred to, combined with European habits, and probably also a certain state of the constitution, generated by the previous heats, predispose to such severe attacks, in which organic affections, and local inflammations, as modified by them, predominate. Hepatic affections are frequent, especially where unfavorable habits of life concur; but Dysentery is by much more common, of which the chronic state is most frequently to be found among the invalids resorting hither from other quarters.

The Dysentery in its acute stage proves occasionally but not very frequently a fatal disease, and much oftener has a favorable result, even where the symptoms at its onset are severe and threatening. Such a result, I believe, to be greatly promoted when opiates are entirely refrained from, and the treatment conducted by purgatives, ipecacuanha, and mercurialising the system by means of the triturated oxides of quicksilver, interposing calomel merely as a purgative, and when indicated as such. Jaun-

dice, with or without the complication of biliary concretions, may be reckoned among the autumnal diseases, and in their phenomena, as well as the requisite treatment, correspond with the same malady elsewhere.

When enumerating the maladies most frequent at the period now adverted to, I should have been satisfied with stating the Cholera to be one, meaning the disease known under that name in all ages of which we have medical records, and in most countries: but that far more dreadful scourge, which bears the appellation, having extended itself over the globe, seems to call for some slight farther notice on the subject; especially as in most accounts of the disease, and even the authorized ones, its having spread from India to this country has been assumed as part of the history of the disease, and the ravages committed by it here, narrated as a striking part of that.

When on a former occasion I transmitted to the Society the information I had sought respecting the disease, as it appeared in the Phillipine Isles, when it broke out there in 1822, I stated my reasons for believing that this quarter had been exempted from the visitation of any other than the ordinary disease, bearing the name, and I am still permitted to think that we have continued to be so favored. The severity and degree of prevalence have differed in different seasons, but in the worst the proportional mortality has been small. In the year in which

most alarm respecting it was created here, I believe I mentioned in the communication alluded to, that a census had been instituted of the Portuguese population at Macao, in order to ascertain the rate of mortality, which during the whole year, and from all diseases, did not exceed $2\frac{1}{2}$ per cent., that including deaths of children, among the garrison, and the slave population. In the more aggravated cases of the disease, it is not easy to state wherein the symptoms differ from those of the deadly malady: there are the same symptoms of general collapse in the attack, prostration of strength, muscular and circulatory, in its course ; the abdominal pain and præcordial anguish ; the vomiting and purging of whitish mucus, as in other cases of bilious matters ; the torturing cramps of the muscles exhibit themselves, as, when such cases have proved fatal, did the appalling phenomenon of muscular motions after the apparent extinction of life. Still in the far greater proportion of cases, the violence of the symptoms soon ceases, and the subsequent recovery is speedy and complete.

Very different indeed would be the statement, had the Indian Cholera reached these shores; nor do I presume to infer identity of the two diseases from a correspondence of some symptoms, more than I would pronounce on the real plague, from having witnessed an epidemic catarrh, or to judge concerning the yellow fever from those congestive and gastric effections which are known by the name of bilious attacks.

I beg leave to add, that, I have not yet seen reason to alter the views with regard to some modes of treatment, which I ventured to submit in the communication alluded to; so that in the probable event of the visitation reaching us, I had resolved upon following that grounded upon received pathological principles, and the practical application of them which experience and general consent have led to the adoption of; at any rate, until they should be found as unsuccessful as different, and some very opposite modes of practice, which have been resorted to have proved; and which appear still to have left the disease one of the most destructive, if not the most so, inflicted upon mankind.

During the winter months, there is a greater exemption from sickness than at any other period of the year; the intermittents occurring then are quite regular in their type, and are invariably amenable to the proper exhibition of Cinchona. Catarrhal affections, owing to the vicissitudes of temperature, are frequent, and pulmonary disease in the predisposed, is most readily induced, and where already formed, deteriorates with great rapidity after the commencement or middle of October; and that it is climate solely which acts so injuriously is proved by the rare exceptions where the weather has continued mild and steadily equable until the end of December, when the progress of pulmonary disease has been slower, and improvement observed to take place.

It is not usual for the regular epidemics to appear before spring, unless in seasons when S. E. winds and a humid atmosphere are more than usually prevalent. They make their appearance from February onwards, the principal being small-pox, at all times a destructive disease, but in some seasons more so than in others, so as to have reduced it to an observation among the Chinese, that when the disease appears so early as January, it announces a peculiarly severe epidemic: the more usual time of its appearance being the middle or end of February.

The mortality invariably caused by the disease formerly, has received a manifest check, from the univeral recourse at Macao and Canton to the practice of Vaccination, which in my endeavours to set on foot and continue here, since 1805, I have found to be met with a degree of practical good sense, and a cautious admission, and at last adoption by the Chinese community, especially at Canton, which is most creditable to their intelligence. The annual recurrence of the disease amongst them, and the crowded state of their houses by the aggregation of families they contain, afford every proof of the general efficacy of the practice which an unprejudiced mind can require. The Chinese are familiar with the occurrence of a varioloid disease corresponding to chicken-pox, or as they call it water-pox, as happening after spontaneous or inoculated variola, before the other practice was at all known to them, which is now spreading in the other provinces, and has even reached

the capital, Pekin. Measles are of less frequent recurrence, but certain to return, though at unequal intervals, sometimes of two, at others of four or five years, severe as the fever, and eruptive state are concerned, but rarely having any other than a favourable termination, owing probably to the usual appearance of the disease being in early summer, so that the catarrhal and pneumonic sequela are comparatively slight.

The hooping cough is also of biennial or triennial recurrence, often obstinate, but rarely fatal.

In 1819, and also (I believe) in 1826, we had the epidemic which has afforded so much scope for tropical description in both hemispheres, and which appeared, especially on the former occasion, to be allied to Scarlatina, which disease in its regular form is also well known here, where so far as I have seen it, it has been milder than it is represented as being in other parts of China.

The Influenza is one of the epidemics of China; it appears very probable to me that it originates in this country, where it recurs at uncertain intervals, never longer than of a few years. Its appearance here generally precedes its breaking out in other parts of the world, at times proportioned to their distance from hence. In its progress to Europe, its most usual track seems to be through the Russian dominions, and to reach Britain and France in the second year after its reign here. Its former attack was in

its strength in the month of March ;—its last (since which this is now the third year) was in October and November, when few escaped the complaint ;—by the ensuing March and April, it was equally prevalent in the Island of Luconia. It has never been a fatal disease, although the symptoms in the febrile stage sometimes prove urgent, and the sensations in the chest create a peculiar alarm to the patient, appearing to indicate, but rarely requiring blood-letting, and still seldomer benefiting by that : the stage of cough and expectoration, with debility and an imperfect convalescence, seldom last shorter than two weeks, and are often of longer duration. The accounts of the disease, when it first became known, or rather received the accurate attention of British physicians in the middle of the last century, and at different subsequent periods, are admirably correct, and minutely applicable as the disease appears here, and their views regarding its treatment also seem to have been equally sound and judicious.

During the summer months, and in some seasons more than in others, those congestive attacks connected with digestive and secretory derangement, which have been denominated bilious, and in an aggravated degree, bilious fevers, are to be met with. The endemic maladies of the climate and country also occur, but unless in peculiar seasons, are not very prevalent, so that upon the whole, the period from the end of May to the middle of August may be deemed salubrious.

The preceding observations will be found to bear in many points on the queries transmitted, so as to leave little to add in reply to them: I shall enumerate them, and in the attempt to reply to them, submit what occurs to me.

Query 1st.—What class of invalids, i. e. what conditions of impaired health, derive benefit by residence in China?

The climate during the cold season is most favourable in that asthenic state which is induced by previous ill health; much and sedentary occupation under an insalubrious climate or season, or by dissipation and various forms of excess under the same circumstances; provided such habits are refrained from, and that any of the disordered states supposed are still functional only. Broken health, arising from the ill defined forms of fever, or from paludal or other miasmatic causes, have appeared more clearly to benefit by the climate than most others; but then there has been a concomitant use of Cinchona in some or several formulæ, free enough to remove the symptoms, and sufficiently long continued to obliterate the tendency to and habit of recurrence of them. Chronic Fluxes have frequently benefited or been removed while here, at least those not kept up by visceral or other organic disease. Dyspepsia may be enumerated with the complaints to which the climate is friendly. The dyspeptic hypochondriasis before adverted to, improves only while the novelty of change lasts, which here is peculiarly short-lived.

Chronic Rheumatism has derived advantage from a change hither, as has that state of Asthenia, perhaps Anæmia, induced by severe mercurial courses. A peculiarity in several patients, who have been in the latter predicament, though I know not if from that cause, is, an almost paralytic inefficiency of the lower extremities, with a sense of girding in the flexors, which has continued after the general health was restored; but this symptom ultimately gave way also.

We formerly had invalids resorting hither in very deplorable states of health, under various and very advanced forms of constitutional syphilis; with whom that mineral had not in a kindly manner done its duty: these cases occurred while the efficacy of nitric acid in such maladies, the pseudo-syphilitic hypotheses, and more recently non-mercurial treatment, were in their turns, dominant over a portion of medical opinion. Such cases now seldomer come on here; but while prevalent, their result encouraged the belief of our climate being favorable for the conduct of long-protracted mercurial courses.

Query 2.—How long a residence in China is usually requisite to produce a beneficial change in such patients?

That in most cases ought to be limited by the northerly monsoon; the most salubrious and agree-

able months of which are November, December, and January.

Query 3.—What are the conditions of constitution which do not improve by the invalids' residence in China ?

It has already been shown, that pulmonary affections of every description come under that head ; and with evidence approaching to certainty that this climate produces an injurious influence on those labouring under, or predisposed to such, I believe the remark may be extended to any form of organic disease in which hectic is established. There is a form of chronic aphthæ with cachexy and purging, of which bad cases have come from India, the worst from the Island of Luconia, and we have had indigenous examples also, which might be deemed exceptions to what has been said respecting Chronic Flux, but in which the purging is merely symptomatic ;—where there is hectic frequency of pulse, the issue of the disease is generally unfavorable.

Query 4.—What is the most eligible period for arrival in China, of those invalids, who may reasonably expect benefit from residence there ?

As shortly before the expiration of the northerly monsoon as may be possible, in order to ensure a passage up the Chinese Sea, and at the same time to

avoid the equinoctial storms. That will probably be in the end of August, or so early in September, as still to leave a month in which the climate will be found little different from, or improved beyond that of India.

Query 5.—Such statement as you think proper, relative to the average temperature of each month of the year; with some notice of the degree of humidity of the atmosphere, and in what months the vicissitudes of temperature are greatest?

The observations interspersed among the preceding notices may be referred to as being applicable in reply to this query, as well as the meteorological tables for two periods of three years each, which accompany this. In the latter, the average monthly heat is expressed; still the greater vicissitudes of temperature are diurnal, and not exactly conveyed by such tables. October and November, and from the middle of March to that of May, are the two periods when such changes are both greatest and most frequent. At any time of the year the change from a N. E. to a southerly wind, or the contrary; produces very unpleasant, and trying extremes of temperature, most so in the months specified.

Query 6.—What sort of accommodations are available for invalids arriving in China, and what servants should be taken from this place?

The preceding notices will suggest how limited accommodation must be in Canton, especially during the winter, which is the commercial season. In Macao the resources are better, though still limited; and every person, especially family, ought to arrange by some conveyance previous to their own embarkation for having accommodation provided. With regard to servants, I apprehend, that the circumstances of each individual in that point must regulate their decision; whether they shall bring domestics with them, or follow the more generally convenient plan of trusting to those of the country they are about to visit. Indian servants have frequently proved burthensome, and have suffered from Intermittent Fevers during the cold weather.

Query 7.—Such notice as you may judge advisable to send, of the Medical Topography?

In the preceding observations, such notices are interspersed as have occurred to me, as bearing upon the topography in its medical relations.

I remain,

&c. &c. &c.

A. PEARSON.

Canton, Nov. 16, 1832.

To W. TWINING, *Esq.*

Canton and Macao, 1809.	Thermometer. Morning.	Noon.	Evening.	Barometer. Morning.	Evening.	Weather.	Winds. Noon.	Rain fallen.	Remarks.
January, ...	61,46	64,34	59°	30,40	29,87	Cloudy, .. 1 day. Clear, ..30 days.	N. 13 ds. S. 11 ds. N. E. 2 ds. S. E. 2 ds. E. 3 ds.	Inches. $1\frac{40}{100}$	The Ther. is an avg. of 26 days. Bar. of 29 ds. mg. & 25 ds. evg.
February, ..	58,32	64,34	59°	30,42	29,99	Light clouds and rain, 17 do. Clear,....11 do.	N. 14 ds. N. E. 4 ds. S. 6 ds. S. E. 3 ds. N. W. 1 d.	$21\frac{38}{100}$	
March, ...	62,27	75,22	68,42	29,92	29,87	Cloudy,..13 do. Clear,.... 7 do. Rain, ... 2 do.	N. 8 ds. N. E. 1 d. E. 9 ds. S. E. 1 d. S. E. 4 ds.	7.07	The Therm. & Baro. mark an average of 26 days.
April, ...	66,46	74,83	71,87	29,73	29,65	Clear,....13 do. Cloudy, ..14 do. Rain, ... 3 do.	N. E. 8 ds. E. 7 ds. S. E. 5 ds. S. W. 10 ds.	$7\frac{34}{100}$	
May, ...	74,29	80,16	76,83	29,92	29,41	Clear,....19 do. Cloudy, ..10 do. Const.rain, 2 do.	N. 1 d. N. E. 9 ds. N. W. 1 d. E. 6 ds. S.E. 7 ds. S. W. 7 ds.	$29\frac{41}{100}$	
June, ...	79,96	84,68	63,16	29,62	29,50	Clear,....18 do. Cloudy, .. 8 do. Rain, ... 4 do.	N. E. 3 ds. S. E. 7 ds. S. W. 20 ds.	$29\frac{64}{100}$	
July, ...	78,96	83,82	81,15	29,22	29,21	Cloudy, ..12 do. Clear,....13 do. Rain, ... 6 do.	E. 11 ds. N. E. 6 ds. S. W. 14 ds.	27.05	Thunder 1 day.
August, ...	79,43	82,06	81,67	29,59	29,62	Clear,.... 3 do. Cloudy, ..13 do. Rain, ... 5 do.	E. 3 ds. S. E. 3 ds. N. E. 1 d. S. W. 24 ds.	$68\frac{18}{100}$	Weather taken on 21 days only.
September, ..	77,56	85,56	80,96	29,61	9,31	Clear,....17 do. Cloudy, ..11 do. Rain, ... 4 do.	E. 7 ds. N. E. 14 ds. S. E. 5 ds. S. W. 4 ds.	$20\frac{37}{100}$	
October, ...	73,32	79,85	77,28	29,76	29,66	Clear,....19 do. Cloudy, .. 8 do. Rain, ... 4 do.	N. E. 14 ds. E. 9 ds. S. E. 6 ds. S. 2 ds.	$12\frac{77}{100}$	
November, ..	66,48	76,99	71,36	30,02	29,89	Clear,....19 do. Cloudy,.. 6 do. Rain, ... 4 do.	N. 17 ds. N. E. 1 d. E. 6 ds. S. E. 4 ds. S. W. 1 d.	0,20	
December, ..	54,16	55,54	56,35	30,33	30,23	Clear,....12 do. Cloudy,..19 do.	N. 26 ds. N. E. 1 d. N. W. 1 d. S. 1 d. S. E. 2 ds.	0,82	

Canton and Macao, 1810.	Thermometer. Morning.	Noon.	Evening.	Barometer. Morning.	Evening.	Weather.	Winds. Noon.	Rain fallen.	Remarks.
January, ...	51,06	57,50	58,30	30,72	30,02	Clear, .. 13 days. Cloudy,.. 7 do. Rain, .. 1 do.	N. 23 ds. S. 6 ds. S. E. 1 d. S. W. 1 d.	Inches. 0 10	
February, ..	55,53	59,89	57,96	30,10	30,01	Clear, .. 13 do. Cloudy,.. 14 do. Rain, ... 1 do.	N. 13 ds. N. W. 1 d. S. 8 ds. S. E. 3 ds. S. W. 1 d. S. E. 1 d.	0 30	
March, ...	Average of 25 days. 63°	66,56	65,60	29,96	29,97	Clear,.... 11 do. Cloudy,.. 10 do. Rain,.... 4 do.	N. 4 ds. N. E. 10 ds. S. 2 ds. S. E. 4 ds. S. W. 1 d. E. 4 ds.	5,30	
April, ...	71,50	74,71	72,76	30,04	29,41	Cloudy, .. 24 do. Rain, ... 3 do. Clear, .. 3 do.	N. E. 8 ds. S. 1 d. S. E. 9 ds. S. W. 1 d. E. 5 ds.		
May, ...	73,91	81,01	76,57	29,64	29,58	Clear, .. 7 do. Cloudy,.. 15 do. Rain, .. 9 do.	N. 1 d. N. E. 6 ds. S. E. 4 ds. S. W. 10 ds. S. W. 10 ds.	24 $\frac{4}{100}$	
June, ...	80,25	84,33	81,87	29,63	29,50	Clear, .. 1 do. Cloudy,.. 16 do. Rain, .. 3 do.	S. W. 23 ds. S. E. 6 ds. E. 1 d.	21 $\frac{14}{100}$	
July, ...	83,26	85,28	83,44	29,52	29,51	Clear, 14 do. Cloudy, 4 do. Rain, 4 do. Hazy, 1 do.	Avg. 22 ds. S. W. 16 ds. E. 6 ds.	Rain in 22 ds. 30 inches.	
August, ...	..	..	wanting.						
September, ..	77,32	81,86	80,21	29,56	29,54	Clear, .. 14 do. Cloudy, . 10 do. Rain, .. 4 do.	N. E. 11 ds. S. W. 4 ds. E. 11 ds.	68 $\frac{61}{100}$	
October, ...	75,51	80,62	79°	29,63	29,66	Clear, .. 20 do. Cloudy,.. 9 do. Rain, .. 2 do.	N. 3 ds. N. E. 9 ds. S. 4 ds. S. E. 5 ds. S. W. 11 ds.	18 $\frac{23}{100}$	
November, ..	52,76	69,66	65,83	29,77	29,71	Clear, .. 20 do. Cloudy, . 7 do. Rain, .. 3 do.	N. 23 ds. N. E. 2 ds. S. 4 ds. S. E. 1 d.	16 $\frac{12}{100}$	
December, ..	58,30	63,09	62,36	30,10	29,88	Clear, .. 23 do. Cloudy, . 7 do.	N. 26 ds. S. 4 ds. S. E. 1 d.	No rain collect-	

Canton and Macao, 1811.	Thermometer. Morning.	Noon.	Evening.	Barometer. Morning.	Evening.	Weather—Noon.	Winds. Noon.	Rain fallen.	Remarks.
January, ...	55,59	60,25	59,25	30°	29,94	Clear, .. 10 days. Cloudy,.. 17 do. Rain, .. 4 do.	N. 21 ds. N. E. 1 d. S. 8 ds. S. E. 1 d.	Inches. $2\frac{50}{100}$	
February, ..	53,59	56,87	56,06	30,06	30,20	Clear, .. 6 do. Cloudy, . 14 do. Rain, .. 8 do.	N. 21 ds. S. 4 ds. S. E. 3 ds.	not stated.	
March, ...	59,23	64,97	63,83	29,94	29,82	Clear, .. 3 do. Cloudy, . 20 do. Rain, .. 8 do.	N. 15 ds. S. 15 ds. S. W. 1 d.	$34\frac{70}{100}$	
April, ...	66,83	72°	69,56	30,35	29,73	Clear, .. 4 do. Cloudy, . 22 do. Rain, .. 4 do.	N. 7 ds. N. E. 2 ds. S. 11 ds. S. E. 4 ds. S. W. 2 ds. E. 4 ds.	$39\frac{35}{100}$	
May, ...	76,45	78,74	77,18	29,86	29,57	Clear, .. 13 do. Cloudy, . 12 do. Rain, .. 6 do.	N. E. 3 ds. S. E. 11 ds. S. E. 5 ds. S. W. 12 ds.	$31\frac{71}{100}$	
June, ...	78,75	83,43	80°	29,39	29,37	Clear, .. 11 do. Cloudy, . 8 do. Rain, .. 11 do.	N. E. 1 d. E. 11 ds. S. E. 7 ds. S. W. 1 d.	$31\frac{76}{100}$	
July, ...	80,20	82,25	81,46	29,48	29,43	Clear, .. 12 do. Cloudy, . 10 do. Rain, .. 9 do.	N. E. 1 d. S. 1 d. S. E. 13 ds. S. W. 13 ds. E. 3 ds.	$34\frac{46}{100}$	
August, ...	81,45	83,82	83,77	29,56	29,46	Clear, .. 18 do. Cloudy, . 11 do. Rain, .. 3 do.	N. E. 1 d. S. E. 10 ds. S. W. 16 ds. E. 4 ds.	$34\frac{46}{100}$	
September, ..	78,78	81,70	80,05	29,60	29,56	Clear, .. 15 do. Cloudy, . 10 do. Rain, .. 5 do.	N. E. 11 ds. S. W. 6 ds. S. E. 2 ds. E 11 ds.	$48\frac{39}{100}$	
October, ...	75,28	79,53	78,25	29,73	29,75	Clear, .. 17 do. Cloudy, . 8 do. Rain, .. 3 do.	N. 5 ds. N. E. 11 ds. S. 8 ds. S. W. 4 ds.	$49\frac{32}{100}$	
November, ..	66,40	75°	73°	29,86	29,76	Clear, .. 15 do. Cloudy, . 15 do.	N. 14 ds. N. E. 2 ds. S. 10 ds. S. E. 4 ds.	$2\frac{04}{100}$	
December, ..	54,83	63,46	62,43	30°	29,50	Clear, .. 29 do. Cloudy, . 1 do. Rain, .. 1 do.	N. 22 ds. S. 6 ds. S. E. 3 ds.	$0.\frac{45}{100}$	

Macao, 1829.	Thermometer.		Barometer.		Hygrometer.		Weather.	Rain fallen.	Remarks.
	7 A. M.	2 P. M.	7 A. M.	2 P. M.	7 A. M.	2 P. M.			
January, ...	59,30	60°	30,13	30,10	73°	57°	Fine, ... 14 days. Cloudy, ... 5 do. Rain, ... 12 do.	Inches. $2\frac{3}{10}$	
February, ...	57°	57,71	30,15	30,17	66°	66°	Fine,..... 2 do. Cloudy, ... 8 do. Rain, ... 18 do.	$5\frac{7}{10}$	
March,.....	64,87	68°	30,11	30,20	77°	61,70	Fine,..... 16 do. Cloudy, ... 8 do. Rain, ... 7 do.	$1\frac{5}{10}$	
April, ...	71,76	74,50	29,99	29,98	80,36	67,53	Fine,..... 2 do. Cloudy, ... 7 do. Rain, ... 20 do. Thunder,.... 1 do.	10	
May, ...	78,64	81,50	29,95	29,02	86°	64,61	Fine,..... 8 do. Cloudy, ... 10 do. Rain, 13 do. Thun. 2 do.		
June, ...	84°	87,16	29,89	29,83	81°	67,80	Fine,..... 17 do. Cloudy,..... 1 do. Rain, ... 12 do.	$4\frac{5}{10}$	
July, ...	86,90	87,48	29,88	29,50	88°	70°	Fine,..... 23 do. Rain, ... 8 do. Do. with Thun. 1 do.	$1\frac{8}{10}$	
August, ...	83,25	84,98	29,92	29,87	82,40	71°	Fine,..... 17 do. Rain, ... 14 do.	$8\frac{7}{10}$	
September, ...	82,83	86,70	29,88	29,87	81°	63,90	Fine,..... 15 do. Rain, ... 13 do. Cloudy, ... 2 do.	8	
October, ...	75,40	79,48	30,08	30,11	71,76	62°	Fine,..... 21 do. Cloudy,..... 1 do. Rain,..... 9 do.	$2\frac{7}{10}$	
November, ...	68,50	70,93	30,26	30,25	57,80	36°	Fine,..... 28 do. Cloudy,..... 2 do.	0	
December, ...	62,36	66°	30,23	30,22	79°	65,81	Fine,..... 24 do. Cloudy, ... 5 do. Rain,..... 2 do.	$1\frac{3}{10}$	

Macao, 1830.	Thermometer.		Barometer.		Hygrometer.		Weather.	Rain fallen.	Remarks.
	7 A. M.	2 P. M.	7 A. M.	2 P. M.	7 A. M.	2 P. M.			
January,.....	61,42	65,42	30,28	29,94	72,13	56,77	Fine,.. .. .. 27 days. Cloudy,.. .. 4 do.	Inches. 4	
February,..	66,22	63,46	30,22	30,20	70,96	73,46	Fine,.. ..... 25 do. Rain,..... 3 do.	1	
March,.....	61,48	72,47	29,95	29,82	82,54	74,84	Fine,.. .. .. 11 do. Cloudy,..... 16 do. Rain,..... 4 do.	2	
April,..	73,40	76,20	29,85	29,49	81°	70,90	Fine,..... 18 do. Cloudy,..... 16 do. Rain,..... 2 do.		
May,....	77,22	80,67	29,36	..	86°	74½°	Fine,..... 13 do. Cloudy,..... 7 do. Rain,..... 10 do.	5	
June,.....	83,50	87,48	29,88	29,90	87	75½°	Fine,..... 22 do. Rain,..... 8 do.	5	
July,..	86,86	87,93	29,84	30,02	90°	76°	Fine,..... 17 do. Rain,..... 14 do.	6½	
August,.....	83°	87°	29,96	29,90	91°	88°	Fine,..... 18 do. Rain,..... 13 do.	7½	
September,.....	81°	84°	29,84	29,90	80°	76°	Fine,..... 18 do. Rain,..... 12 do.	15	
October,.....	78,50	81,80	30,05	30,07	89°	76°	Fine,..... 15 do. Cloudy,..... 8 do. Rain,..... 8 do.	4	
November,.....	69,46	71,83	30,26	30,26	77°	72,90	Fine,..... 10 do. Cloudy,..... 12 do. Rain,..... 8 do.	1	
December,.....	57,93	62°	30,31	30,27	..	64,89	Fine,..... 26 do. Cloudy,..... 5 do.		

Macao, 1831.	Thermometer.		Barometer.		Hygrometer.		Weather.	Rain fallen.	Remarks.
	7 A. M.	2 P. M.	7 A. M.	2 P. M.	7 A. M.	2 P. M			
January, ...	62°	67°	30,26	30,24	88°	70°	Fine,.. .. .. 25 days. Cloudy, ... 5 do. Rain,..... 1 do.	Inches. 0	
February, ...	59,21	59,60	30,14	30,13	88,30	77,30	Fine, ... 2 do. Cloudy,..... 22 do. Rain, ... 4 do.	1	
March, ...	66,83	66,45	30,24	30,19	89°	72°	Fine, ... 15 do. Cloudy,..... 13 do. Rain,..... 3 do.	$\frac{1}{2}$	
April, ...	73,43	76,23	30,10	30,40	83,50	82,90	Fine, ... 21 do. Cloudy, ... 3 do. Rain, ... 6 do.	$6\frac{1}{2}$	Thunder on one day.
May, ...	75,99	77,80	29,30	29,95	85,90	70°	Fine, ... 9 do. Rain, ... 22 do.	$23\frac{3}{4}$	Thunder, 2 days.
June, ...	82,12	84,56	29,91	29,92	84,63	76,50	Fine, ... 16 do. Cloudy, ... 3 do. Rain, ... 11 do.	$7\frac{1}{2}$	
July, ...	86,23	88,40	29,93	29,87	84,49	81,50	Fine,..... 27 do. Rain, ... 4 do.	6	Thunder, 1 day.
August, ...	82,60	85,67	29,78	29,88	88,50	79°	Fine, ... 20 do. Cloudy, ... 2 do. Rain, ... 9 do.	7	Thunder, 2 days.
September,.....	80,63	80,20	30°	29,66	89°	80°	Fine, ... 18 do. Cloudy, ... 2 do. Rain,..... 10 do.	$11\frac{1}{10}$	Thunder, 1 day.
October, ...	76,22	78,58	29,80	29,80	24,72	24,72	Fine, ... 20 do. Cloudy, ... 3 do. Rain, ... 8 do.	$7\frac{6}{10}$	
November,.....	68,63	68,73	29,80	30,11	66°	54,70	Fine, ... 21 do. Cloudy, ... 6 do. Rain, ... 3 do.	$\frac{5}{10}$	
December, ...	62°	65,12	30,22	30,23	78,51	74,57	Fine, ... 21 do. Cloudy, ... 8 do. Rain, ... 2 do.	$\frac{5}{10}$	

*** *From obscurity of the M. S. there may be an error in the quantity of rain stated for July,* 1809, *and May and June,* 1811.

ON

THE USE OF LIQUOR AMMONIÆ PURÆ

IN

CHOLERA.

By A. STEART, Esq.

Presented 1st September, 1832.

The cholera made its appearance at Mundlesir, a small station on the north bank of the Nurbudda early in August, 1830, for the first time after I had taken charge of my present appointment, as Surgeon to the Political Agency there. The disease had sometime previously shown itself above the Vindhya range, and also to the southward of the Nurbudda, and the first case I had here was a man who had just descended the Ghaut.

For many previous years, the cholera had prevailed annually, in the Nimar districts; but during the month of August, 1830, it showed itself in a most aggravated form, the principal symptoms, and treatment, &c. of which, I will now state.

With a very few exceptions, in all the cases I have had, the patient, without previous illness, suddenly feels a general uneasiness and anxiety, instantly throws up with great force an immense quantity of fluid, much resembling conjee [rice-water] or butter-milk, and falls senseless to the ground. He passes the same kind of fluid by stool, in large quantities, (at first sometimes mixed with fæces,) and he lies in an insensible state.

The pulse immediately becomes imperceptible, either at the arm, fore-arm, or temples. The body cools so rapidly, even in this hot climate, that in a few minutes no heat is felt in any part of it; and there is a little, cold and clammy perspiration about the head and chest. The nails are like those of a dead person, and the skin of the inside of the hand puckered and soddened.

The breath feels cold, the respiration is quick and difficult, with little or no action of the diaphragm.

The mouth open; tongue rough; eyes shut and very much sunk in their orbits; if opened they appear glassy and without the least brilliancy; conjunctivæ pale, and iris apparently not affected by light. Around the eyes is a black circle or mark, and the person appears ghastly and looks many years older than he did an hour previously. A violent spasmodic extension of all the limbs takes place whilst in the act of vomiting; excepting when this occurs, the

patient lies quiet and insensible as to what is passing around. When vomiting comes on, the body is completely stiffened. There are little or no efforts at retching, but the evacuations both upwards and downwards pass in immense quantities. There is no fætor in the evacuations, except sometimes a little in the first motion ; the belly is completely flattened.

The blood is dark, thick, and apparently in a state of decomposition ; when it imperfectly coagulates it looks like liver, or rather of the consistence of, and resembling, bad black-currant jelly.

Treatment.

Give immediately 30 drops of pure Liquor Ammoniæ [half a tea-spoonful] diluted with $3\frac{1}{2}$ drams [nearly a table-spoonful] of distilled water ; and a few drops of any essential oil may be added or not. In some cases, I used an essential oil supposed to be the true spikenard, prepared from a grass which grows in this part of the country. Instead of distilled water, brandy more or less diluted may be used if deemed advisable, but perhaps a good plan will be to get an eight-ounce bottle with a glass stopper, into which pour one ounce of pure Liquor Ammoniæ, and very nearly fill the bottle with distilled water ; should you wish to give any essential oil, add about a tea-spoonful of Oil of Peppermint, or a larger quantity of essence, or any other essential oil you may prefer. A table-spoonful of the mixture will be a dose for an adult. It must be swallowed immediately

after being poured out: take great care also that the bottle be kept carefully closed. You must forcibly close the patient's nostrils and mouth, ere the medicine will be swallowed; the act of doing which generally induces a slight cough. This and breathing are the only symptoms which show the patient to be still alive.

A bottle containing Volatile Alkali is to be applied at intervals to the nostrils. I have also held it to the mouth.

If the medicine be rejected by vomiting, repeat it again and again till you get a dose to remain in the stomach, eight or 10 minutes after which the patient will be certain of recovering. Repeat the dose at intervals of 5, 10 or 15 minutes, according to the state of the patient; but the moment you find reaction has commenced, lessen the quantity. To children give a less quantity of the Alkaline Mixture, diluted according to their ages.

Apply heat in every possible way to the body; to all the extremities apply heated bricks, tiles, or bottles of hot water: but with care, as the patient is generally insensible.

Open one or more veins, and do your best to procure blood, which will flow most probably only in drops, and even at that rate not without much trouble and perseverance. Continue your efforts to pro-

cure blood till reaction has taken place, but when this has fully commenced, stop. When reaction is about taking place, you will find that after calling several times, and doing your utmost to rouse the patient, he will give an indistinct answer, apparently with great difficulty, and as if he was in a stupor.

The first symptoms of recovery are, there being neither vomiting or purging. The breathing gradually becomes easier, and the pulse begins to be perceptible, first in the temples and arms, and then in the forearm, about which time the skin very gradually gets warm. After this, the patient gets sensible, speaks in a very low tone with difficulty, but complains of nothing but thirst: for which give a small quantity of any mild bland fluid. The pulse after reaction has taken place is very quick and small, skin tolerably comfortable, and thirst gradually lessens. The patient has some disturbed sleep during the night.

In the morning give a small quantity of Magnesia and Rhubarb, or in fact any mild purgative, to the extent of producing a few motions; the first and second of which are generally of a dark color. Very little urine is secreted for a considerable time after an attack.

The patient now complains of his throat, speaks in a low tone, and with difficulty; also experiences very great weariness and aching of limbs, which does

not wholly leave him for three or four days. There is a want of appetite for some time after recovery, the digestive organs being much debilitated by the attack. The sooner assistance is rendered the better, for without it the patient will not survive more than a few hours, if the attack be at all severe.

When I decided on this plan of treatment, not being able at this remote station to procure [unless by very great delay], a pure solution of Ammonia, I distilled some myself, for the process of which, see Henry's Chemistry, vol. i. p. 397, 1823*.

On the appearance of the Cholera here in August, 1830, it should be mentioned, that in the few first cases I had, in which I adopted the treatment usually followed, of large doses of Calomel, Opium, and stimulants, and also tried blisters of scalding water, all the patients died; when fearing I might be equally unfortunate with others, should the symptoms be at all violent, I was induced after much reflection to adopt the course which I now have the honor to transmit; and in which I have been as successful as my most sanguine hopes could have led me to anticipate.

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* Mix three parts of quick-lime *(choona)*, with one part of Sal-Ammoniac in powder *(Nousader)*, in a retort, and by the heat of a lamp, the pure Ammonia is extricated in a gaseous form; it combines rapidly with water, which is capable of absorbing 780 times its bulk of this gas; and when saturated to that degree, the quantity of the liquid is increased in the ratio of $\frac{4}{10}$ its original bulk.

My reason for not having communicated the result of my practice, immediately after the sickness of 1830 had subsided, arose from anxiety to be more fully satisfied of its efficacy ; and this, from the usually annual visits of this dreadful disease to Nimar, I had but too much reason to suppose, I should soon have an opportunity of ascertaining. This year, thank God, I had but six patients ; four of whom were insensible, and two not ; but the whole recovered, and I may therefore consider the usefulness of the remedy as sufficiently established, without waiting for further experience.

Abstract of 118 *Cases, treated as now recommended, from* 8*th August to* 7*th Oct.* 1830.

108 suddenly affected without previous illness.
9 affected with giddiness or uneasiness for some hours previous to vomiting.
1 died in an hour and a half.

118

6 cases in July 1831,—four suddenly, two not.

124

Of the whole number, eight were not bled, in consequence of their friends objecting ; these recovered more slowly than the other cases. The average quantity of blood taken was about seven ounces.

Twenty-nine persons in the village, who did not come under my treatment, died in less than 12 hours

after being attacked; and from all inquiries made, it appears that during the season of 1830, every person who was attacked with Cholera, and trusted to native remedies, died. Some of the above patients died so suddenly, as to prevent assistance being rendered them. Of the fatal case which came under my treatment, I beg to remark, that the man had been ill nearly two hours before I saw him. He had repeated doses of medicine administered, but none would remain in his stomach, and he died in about an hour and a half. The symptoms otherwise were exactly the same as those of other patients. In this instance, the Liquor Ammoniæ made by myself being exhausted, I was obliged to use some which I found to be both weak and impure. The body was not examined from religious prejudices.

Although it may be remarked, that in all the cases above alluded to, the patients were natives of India; this does not at all lead me to the slightest doubt as to similar good results amongst Europeans, attending of course to the proper modification of this remedy as with all others.

Various circumstances have hitherto prevented my offering such other observations on Cholera as it was my intention to have done, but which I still hope hereafter to do, should an opportunity occur.

Mundlesir, Nimar, Dec. 1831.

P. S. Within the last month Cholera has again appeared in the Nimar district, at a place about 16 miles from Mundlesir. The Komisdar immediately applied for medicine, and now reports as follows: that of 14 people to whom he gave medicine 10 recovered, eight of whom were insensible, two not so; and that four died. The medicine taken by those who recovered was measured out and sent to them by the Komisdar in small Hindoostanee phials; but having no more, he put the medicine for the people who died into two small "lotahs*," and as it had to be carried to a village distant about two miles in an open vessel, it spoilt, and the people for whom it was sent died.

Camp near Mundlesir, 12*th Feb.* 1832.

Observations of S. LUDLOW, *Esq. Superintending Surgeon, Western Division, on sending Mr. Steart's communication to the Medical Board of Bengal.*

"Whilst on my tour of inspection at Mundlesir, early in December last, Mr. Steart invited me to inquire into his treatment of Cholera; and after comparing his own statements with those of the Political Agent Captain SANDYS, and the native doctor of the station, and even some of the persons themselves, who were the subjects of Mr. Steart's humane care, I certainly came to the conclusion that his practice was unusually successful.

Just at this time, the public accounts from Europe were of the most alarming nature, in regard to the

* Lotah is a small brass vessel.

near approach of the disease to our native shores; and as Mr. Steart wished to take advantage of the steam packet that was about to leave Bombay, and make known to persons in England his remedies in the cure of Cholera, I most willingly complied with his request to afford him my humble testimony of his success; but at the same time, strongly recommended him to furnish me, as soon as practicable, with an official report on the subject, for the information of the Medical Board. This did not reach however until my return to Neemuch, on the 23rd of last month.

There may be objections to the confident manner of Mr. Steart's report; nevertheless, I think he has proved the Liquor Ammoniæ to be a most valuable remedy, in those attacks of Cholera where the patient sinks rapidly, and a powerful stimulus is required, whilst attempts are made to restore the lost balance of the circulation, by that best of all remedies, I am apt to believe, in nine cases out of ten, *blood-letting*. My confidence in the good effects of the Liquor Ammoniæ, was much strengthened, by knowing that Mr. Mottley had found it extensively and decidedly beneficial last year at Ajmeer: which circumstance was duly reported by me to the Board; and when at that station on my tour of duty, I had an opportunity of ascertaining on the spot, that the Ammonia alone, even without bleeding, had deservedly attracted much public notice and discussion, and it was looked upon as a remedy in Cholera,

which would be generally resorted to in future attacks; but it should be observed, that the Ajmeer cases happened at a season of the year, and in a situation, that were more favourable for a mild or modified disease than the Mundlesir ones, which seem to have been of a nature exceedingly severe.

The Board will, I am assured, observe with satisfaction the successful endeavours of Mr. Steart in making the Liquor Ammoniæ of great strength and purity on an emergency with very imperfect means at hand, which on examining I found to be the best I have ever seen in India. This it is true was only resorting to a knowledge which we all possess; nevertheless, the professional zeal and diligence exhibited in the case of the medical officer at Mundlesir, is worthy of praise and imitation. Probably the Board may conceive that Mr. Steart has laid too much stress on the necessity of having the Liquor Ammoniæ of the greatest strength and purity, and that if it should be in a degree weak or inodorous, it would lose its effects altogether. It is true, that this preparation, when exposed to the atmosphere, attracts rapidly carbonic acid, whereby it becomes in some measure impure; and it is desirable of course, that the bulk of the gaseous ammonia should abound as much as possible: but then a somewhat larger dose of the remedy would produce the same effects as the more potent liquor in a diminished quantity.

Under the impression that the usual treatment of Cholera with opium and calomel, especially in large

doses, is far, very far from being successful, and that the Liquor Ammoniæ is worthy of more extensive trial; whilst emetics perhaps, and bleeding are resorted to, to restore the lost balance of the system; and gentle purgatives or mercurial ones, as the case may point out, to assist in carrying off the morbid secretions; I shall think it my duty to suggest such practice, and to order a supply of the Liquor Ammoniæ Puræ, to all the stations of the division, out of the 20 lbs. which has just reached the Depôt: but as this quantity is small, I would take this opportunity of recommending to the consideration of the Board, whether it would not be advisable to order a supply to be sent up immediately by dawk bangy, in well stoppered phials of ounce, two ounce, and eight ounce quantities; which could then be served out to medical officers, without opening; or even sent to individuals, if it should be required.

Neemuch, March 8, 1832.

OBSERVATIONS

ON

SOME OF THE EFFECTS OF IODINE.

By W. TWINING, Esq.

Presented 3rd Nov. 1832.

The efficacy of Iodine in promoting the absorption of Bronchocele, and the beneficial results which have followed its administration in other chronic diseases, have induced some practitioners to employ the same remedy for the cure of obstinate Chronic Affections of the Liver. As far as I have been made acquainted with the effects of Iodine administered in Chronic Hepatic Disease, that practice appears to have been remarkably unsuccessful; and although my present experience does not authorize me to assert that it can never be beneficially employed in any such cases; the symptom which I have occasionally observed subsequent to the use of that remedy, in European patients, who were believed to have been free from any disease of the liver previously; as well as the consequences of the internal administration of large quantities of Iodine, of which mention is made in some recent medical works in

Europe, would afford grounds for believing that the greatest caution is requisite in prescribing it for patients in whom any affection of the liver exists. I have not yet met with any case of Hepatic Disease in which the internal use of Iodine appeared to me justifiable, therefore I cannot venture to speak of the effects of that medicine in such complaints: but in 23 cases of Europeans, for whom I have prescribed it internally, in the course of the last two years, for the cure of various diseases, five patients were affected with pain in the right side. In some of these the pain was felt about the region of the gall-bladder, but more generally the pain was referred to the middle of the ninth rib on the right side, and was slightly increased by a full inspiration. In most of these cases, the Tincture of Iodine had been taken in various doses, from 10 to 24 drops, for above 14 days, and the great number of the patients who were affected, as above described, were of pale complexion, and somewhat emaciated.

The diseases for cure of which Iodine was administered, and the patients soon became affected with pain in the region of the liver, were—1st, an enlargement of the inguinal glands in a man aged about 40; 2nd and 3rd, two young men, each under 24 years of age, suffering from enlarged tonsils; 4th, a slight enlargement of the thyroid gland in an elderly woman; 5th, a chronic enlargement of the right testicle. Besides these, I was called in consultation to see a patient who had been taking Tincture of Iodine for

the cure of an obstinate chronic glandular disease; and another patient came under my care, who had at the time an Abscess in the Liver: he had previously been taking Iodine for many weeks, to cure some imagined affection of the Chest, of the actual existence of which, I could obtain no satisfactory account. As the two last mentioned patients did not take the medicine under my instructions, I am unable to state precisely the quantity which was taken, or the exact period at which the pain appeared after the Iodine was first ordered.

The diseases for which the Iodine was administered, were in four of these cases evidently decreasing at the time that the pain in the side was first felt, therefore I conclude that the constitutions of those patients were then under its influence. The cases, in which the pain in the right side was ascribed to the exhibition of that remedy, occurred at various seasons of the year; and the patients were all Europeans. I may add, that during the same period I have prescribed Iodine in 19 cases of chronic glandular disease in Asiatics, (14 of which were Hindoos,) and none of these patients suffered from pain in the right side, during the time that it was taken. Diseases of the Liver are so prone to occur in this country, that it would be unreasonable to ascribe every affection of that organ happening soon after the internal use of Iodine, to the influence of that medicine: at present it seems doubtful whether Iodine ought to be considered a safe or useful remedy

in any case where Hepatic Disease exists. My principal object in bringing to the notice of the Society such observations as have occurred in the course of my practice in Calcutta, will be accomplished, if by these means the attention of medical men in India be directed to ascertain, whether the unfavorable effects which appear to me to have been caused in several instances by the use of Iodine, are of frequent occurrence. Hepatic affections happen so frequently in Bengal, and are so liable to terminate fatally, that every circumstance which has any influence in promoting or retarding their cure, may be deemed worthy of the attention of this Society, and of the profession in general.

The observations of our professional brethren in Europe, afford reason to believe that Iodine administered in large doses, is liable occasionally to excite pain in the region of the liver; and in some instances, the existence of Hepatitis in such cases, has been proved by post-mortem inspections. Referring to Christisson's excellent work on Poisons, I find that he alludes to two instances in which Hepatitis occurred in persons who had recently taken large doses of Iodine; the first of these is reported on the authority of Rust, (*Magazin fur die gesammte Heilkunde.*) In this case, excessive use of Iodine was followed by pyrexia, emaciation, and pain in the region of the liver, with induration of that organ; and the patient died. The other case is adduced on the authority of Dr. Zinc: a patient died, as it is stated, in consequence of slow

poisoning by Iodine, and on dissection, the liver was found enlarged, and of a pale-red color; there were also various other appearances of inflammation in the abdominal viscera. Dr. Christisson thinks "it is not improbable that Iodine possesses the power of inflaming the liver."

Calcutta, October 18, 1832.

ON

LIGATURE OF THE CAROTID ARTERIES

IN

EPILEPSY AND SOME OTHER DISEASES.

By J. B. PRESTON, Esq.

Presented 3rd March, 1832.

On offering to the Medical Society, the cases of Ligature of the Carotid Arteries which have been published in the fifth volume of their Transactions, I took occasion to represent the pathological views which induced me to propose the treatment I have considered applicable in inveterate cases of Epilepsy; in which other remedies having failed, the patients' complete recovery is considered hopeless. It will be remembered, that I did not propose the operation for trivial or recent cases, or for patients in whom the disease appeared to be dependent on gastric irritation, or other causes, allowing reason to hope for success from medical treatment. If the operation should prove successful, in only a small proportion of cases of Epilepsy which are beyond the reach of other remedies, it will be deemed worthy of some estimation; and it might be advisable in most of those cases where

there is evidence of predominant cerebral irritation, or of local plethora of the brain. At the same time, when we remember how often Epilepsy terminates in paralysis, idiotcy, or apoplexy, and when we observe in many of these cases a succession of symptoms, each of which is more and more distinctly referrible to morbid condition of the brain, and more destructive of the intellectual powers, we are induced to consider whether it be judicious to allow even recent, but very aggravated cases of Epilepsy, to go on until irremediable organic changes are established, without taking measures permanently and effectually to diminish the circulation of blood through the brain.

Some of my professional brethren have observed that as the four great arteries, which supply the head with blood, pass, before reaching the brain, through foramina in bones, which are not in general much larger than the vessels themselves, it is probable that in cases where the carotids are obliterated by the application of ligatures, the vertebral arteries will not very quickly become enlarged, and therefore a permanently decreased flow of blood to the brain is likely to be the result of the operation. If we were certain that in all cases where the common carotid artery has been tied, the blood would by anastomosis reach the upper part of the internal carotid before that vessel enters the cranium, its impetus must be much diminished for a long period. However, I place little confidence in the benefit likely to arise from ingenious speculation in such matters: I trust, that the

mode of treatment which I have employed will have a fair trial; and I confidently rely on the candid judgment of the profession at large.

Lest some of my professional friends should consider the operations in these cases inconsiderately performed, and the previous medical treatment insufficient, it is necessary for me to state, that patients who are invalids or pensioners, are not in all cases very tractable; and though they may be willing to come to hospital for the purpose of undergoing an operation, in hopes that it might remove disease, they are usually unwilling to submit to either a tedious preliminary medical treatment, or to remain quiet in hospital for a sufficient length of time afterwards.

Case 1.—HEAD-ACHE AND PARTIAL PARALYSIS.

Francis Fullingfan, a robust man, a native trumpeter, ætat. 24; admitted into the Garrison Hospital at Cuddalore, August 10th, 1831. Left Arcot July 27th, directed to this station, on account of his health. He had been in the hospital of the 6th Regiment L. C. from April 14th, to July 27th, suffering, at first, from intermitting fever, and subsequently from severe continued pain in the head; for which (the latter) he was recommended change of air, as the remedies employed at Arcot, leeching, blistering, cold lotions, purging, &c. had been found ineffectual. The symptoms under which he at present suffers are as follow: constant pain in the head, particularly the fore part;

when he speaks his mouth and face are drawn to the right side; although his muscles are large, he is extremely feeble, and unable to walk without support; there is an appearance of idiotcy in the expression of his countenance and manner, but his judgment is not impaired; his stools frequently pass away involuntarily; there is partial loss of motion in the left arm and leg; complete loss of vision of the right eye, without any apparent change of structure; this he says was produced by inflammation consequent upon a blow; vision of the left eye greatly impaired; wanders very much at night; evacuations natural.

September 2nd. A very slight and temporary relief was obtained by the exhibition of Iodine, by a seton to the neck, and a blister to the head. His present symptoms are precisely those detailed above, and appear to me attributable to increased arterial action within the cranium; with a view of diminishing which, I have determined after much consideration, upon tying the right common carotid artery.

The right common carotid artery was tied on the second of September, and on the 7th, he was free from head-ache; was much stronger on his legs, and had lost that appearance of imbecility, but continued to wander at night. It was not that the man was actually imbecile, but when he attempted to speak, he had not controul over the muscles of the face, and could not command their expressions. Did these symptoms point out a certain portion of the brain as the seat of disease?

On the 27th, he walked five miles, which fatigued him very much; the next day he complained of great heat in the head, and impaired vision of the left eye: his head was shaved, and on the 29th he was better; a blister was applied the same day between the shoulders, and eight minimis of Tincture of Iodine were ordered three times a day. On the 3rd of October, his vision was not improved, although the head was quite free: he was ordered Calomel and Opium three times a day. On the 6th, there was slight salivation, but no improvement of vision. As the affection of the sight was attributed to some return of the state of the brain for which the first operation was performed; a ligature was applied to the left common carotid artery on the 10th of October. He felt very weak after the operation, although very little blood was lost. He was discharged, on the 11th of November: vision continued imperfect; but in every other respect he had entirely recovered his health. He was subsequently discharged, on account of the defect of vision.

Case 2nd.—Epilepsy and Hemiplegia.

John Parcott, ætat. 51 years, Chelsea pensioner. Admitted 22nd August, 1831. A short stout man; the neck is very short and stiff, and its muscles much contracted, so as to draw the head down upon the chest; the eyes are full, prominent, and have a strained appearance. This man has been subject for six years to very severe epileptic fits, which come on about six or seven times in the month. His present symptoms

are, complete loss of power of the right half of the body, with very great impediment to utterance; the muscles of the face and tongue are drawn to the left side when put in action. This attack of hemiplegia occurred twenty days ago, immediately previous to which he had been drinking hard. The feet are cold; great irritability of temper is evident; the right thumb is bent upon itself, and kept down upon the palm of the hand; if straightened, it becomes bent again immediately, in the same manner: the thumb has been in this state for the last seven weeks, having assumed this position immediately after an epileptic fit. The pulse and skin are natural; there is now some pain in the head, and he has for a long time suffered from head-ache. I do not conceive that any benefit is to be expected from the usual modes of treatment in this case, neither does the continuance of this state appear to me free from danger. Intellectual functions not affected.

August 23rd.—A ligature was applied to the right common carotid artery.

August 24th.—He can move both arm and leg this morning, can straighten the thumb without any assistance from the other hand, and it now continues straight; some head-ache, but less than before the operation; very little sleep; bowels not opened since the 22nd; he speaks better; tongue white; no appetite; thirsty.

℞. Calomel. gr. ii.
Pulv. Rhei ʒss. m. ft. pulv. statim sumend.

August 25th.—Bowels opened three times; slight head-ache, principally affecting the left temple; a good deal of irritability of temper; rather more power of the leg and arm than yesterday; legs cold.

Appl. Hirudines vi. temporibus.

August 27th.—Speaks better to-day; is able now to get up, and was so yesterday; head better; no sleep last night; some pain in the wound; before the operation he had considerable difficulty in moving his head round, he can now do so to a considerable extent; wound healed, except where the ligature projects; bowels open.

August 29th.—More power of leg and arm; more sensation in the leg, and less coldness; he slept well; head-ache nearly gone; he suffers from a sense of noise in the head, when in the recumbent posture; appetite improved.

Half diet.

Sept. 3rd.—He is able to move about with the assistance of two sticks; but suffers from a good deal of pain and stiffness in the right hip.

Liniment. Saponis, ad part. dolent.

Sept. 5th.—Had three epileptic fits yesterday, one at 2 P. M., one at 3, and the last at 5: has not so much power of his arm and leg to-day; does not speak so well; head rather worse; no pain, but great

noise in the head; pulse natural and 72; bowels rather purged, appetite good, sleep last night disturbed.

R. Pulv. Ipecac. Comp. gr. viii. ter die sumend.
Head to be shaved.

Sept. 6*th.*—One very slight fit yesterday; more power of the arm and leg; bowels loose; head a good deal better.

Perstat.

Sept. 7*th.*—There was a slight tendency to a fit yesterday, which however did not come on: he slept particularly well last night; the bowels are rather loose; leg, arm, and head better; he speaks better; the head was shaved yesterday, and he finds himself much more comfortable in consequence.

Perstat.

Sept. 8*th.*—Omit. Pulvis Ipecac. Comp.

Sept. 9*th.*—Had a good deal of head-ache last night, and he did not sleep; pain has been all along on the left side. Some swelling over the temporal muscle on that side; he feels extremely weak; the bowels are regular.

Half a bottle of beer to-day.

Sept. 10*th.*—Appl. Emp. Lyttæ Nuchæ.

Sept. 12*th.*—Skin rather warm; his head feels confused, and he does not speak so well; bowels natural; slept well; appetite good.

Cold Lotion to the head. Omit beer.

Sept. 13*th.*—He feels very much better to-day; head much clearer.

Omit. Liniment. Saponis.

Sept. 14*th.*—Had a very slight fit yesterday, which, as well as all those he has had since the operation, have been different from any that occurred before: his head not becoming confused, and perfect consciousness remaining.

Sept. 15*th.*—A very slight fit yesterday.

Sept. 26*th.*—No fit since last report; head now quite free; wound healed; he is able to walk about with a stick.

Discharged.

Re-admitted 14th November, 1831.

Has suffered much of late from the epileptic fits, which for some time after his discharge from Hospital were very slight, occurring at much longer intervals, and not depriving him of consciousness. There has been much head-ache; and inability to walk without falling; constant throbbing in the head; voice much affected; the epileptic fits much increased in violence and frequency at the changes of the moon; he still continues sensible during the attacks; intellectual functions not affected; the left common carotid artery was tied this day.

Was bled three days before coming into Hospital with some relief; and had leeches applied to his head the day before the operation.

November 15*th.*—Head-ache nearly gone, he speaks better, but did not rest well during the night, from uneasiness in the wound; pulse quick and rather hard, skin hot and dry.

V. S. ad. ʒxii.

Nov. 16*th.*—Complains of the head as yesterday, but he has almost entirely lost the power of the right arm since last report; he cannot speak so well, and is by no means so well to-day; the bowels are rather confined; had three fits since last report. There has been constant and heavy rain for the last 14 hours, which may perhaps have affected him in some way.

R. Calomel. gr. v. Pulv. Jalap. ʒss. statim.

Nov. 17*th.*—Two slight fits yesterday, during which he was perfectly sensible, and free from pain; he has slight uneasiness across the chest, but speaks much better to-day; appetite good; did not sleep well last night; one stool from the purgative.

Repetat. Pulv. Purgans.

Nov. 18*th.*—Very much better, bowels opened five or six times; recovered the use of his right arm

to-day, urine high-colored and scalding; he feels weak; appetite pretty good; had some cramp this morning, but no fit.

R. Pil. Hydrarg. gr. vi. nocte maneque sumd.

Nov. 19*th.*—Had a fit yesterday, the same as he has latterly had them; urine continues scalding.

R. P. Jalap. Comp. ℈ ii. stat. perstat. in usu pilul. bis quotidie.

Nov. 23*rd.*—Former treatment continued daily. A seton inserted at the back of neck.

Nov. 27*th.*—No fits for four days, seton discharging, head quite free; speaks well; slight coldness and numbness of the right leg and arm, for the last three days; bowels loose; appetite good.

Nov. 30*th.*—Nux vomica, gr. i. in form pil. ter die sumend.

December 1*st.*—Some tenderness about the fifth and sixth dorsal vertebræ.

Appl. Ungt. Antim. Tart. P. D.

Dec. 2*nd.*—Had a severe fit to-day. Treatment continued.

Dec. 3*rd.*—Had a fit (very slight) this morning. Nux vomica omitted.

Dec. 7th.—He has had no fit since last report, and is generally very much better; considerable loss of power of the right arm and leg since last report; head quite free; speaks well, and sleeps well; back covered with pimples.

Dec. 8th.—He is extremely anxious to return to his house, as he has a large family, in consequnce of which he is discharged from Hospital, but will receive attendance at his house.

Jan. 25th.—He has had three fits since the third of December; they do not render him, even during their continuance, at all insensible. He can scarcely speak; and walks with great difficulty with the assistance of a stick. He suffers from time to time, from a painful feeling of throbbing and fulness in the head, which is relieved by bleeding. Although a cure has not been effected in this case, owing most probably to some serious organic lesion of the brain, still much has been accomplished. He is able to move about with the assistance of a stick, to sit up, and enjoy the society of his family. I believe that the operations have prolonged his life: the relief at first afforded, by ligature of one carotid artery, was very marked, and he is now much better than before he underwent the second operation. His life, I should conceive, he holds by a very uncertain tenure; and that it will probably terminate, at no very remote period, by the bursting of some blood-vessel within the brain. I think it is impossible to avoid con-

cluding, that the proximate cause of the disease in this case consisted in an increased determination of blood to that organ, kept up by its peculiar condition, or by the injury it sustained during the epileptic fit which caused the Hemiplegia; and that as the anastomosing vessels become enlarged, the symptoms will gradually return. This reasoning, however, by no means applies to every case. In many instances, the state of brain which induces palsy, epilepsy, &c. may be removed before the anastomosing vessels have become enlarged, as inflammation is subdued by temporary depletory measures had recourse to; but if there be a permanent cause of irritation, these depletions, although they may mitigate, will not entirely subdue the inflammatory symptoms; so in other diseases of the brain, depending upon a like cause, a similar result is to be expected. In cases of this kind, we have more power over arterial action within the cranium, by the access we have to two of its principal vessels, than we have over it in any of the other cavities of the body, or in any external situation whatever. In this case both carotid arteries appeared to me very much enlarged.

This patient was re-admitted on the 14th February: unable to speak for the last fourteen days, but he had experienced no fit; the power of the limbs was the same as when last reported upon, and he appeared nearly insensible. The symptoms yielded gradually to purgatives, a seton, leeching the head, and Iodine. On the 8th March, the following report was taken.

He has not at any time since he came under my care spoken so well as he does at present ; he walked about a little to-day with the assistance of a stick, and the power of the muscles of the side increased ; has still some uneasiness in the back of the head, which will probably be removed, at least for a time, by the seton. When this man last came into Hospital, I did not expect him to recover, having long been of opinion that there is some serious organic change within the cranium. I do not believe he would have recovered, at least so rapidly, had not the carotid arteries been previously tied,—a circumstance which must have materially affected the circulation within the head, by rendering the course of the blood more circuitous, thereby diminishing its force. It is however to be expected, that as the anastomosing vessels become enlarged, each succeeding attack will be more difficult of removal.

January 17*th*, 1833.—About three months ago this man had an attack of paralysis agitans, with total loss of speech, but without any impairment of the intellectual functions. These symptoms entirely subsided after he had taken Iodine with purgative medicines for a month ; and he is now able to walk about with one stick, with ease, and speaks with very little impediment.

I am not aware that both carotid arteries have ever been tied at the same time. In a case that occurred in America, they were tied with an interval

of twelve days between each operation, and at no time after was there a single symptom of deficiency of blood in the brain; indeed, at one period, about sixteen or seventeen months after the operation, the opposite state seemed to have existed, as the patient had a flushed face, accompanied with head-ache, daily, for two or three weeks, and was not relieved essentially by cathartics; a single large bleeding entirely removed the symptoms. This it may be observed was the case with Pancott, after a much shorter interval, and occasional venesection is still necessary with him, and affords great relief.

I am indebted to Mr. Twining for calling my attention to the following case in the Annals of Medicine and Surgery, vol. ii. and as it is so much to the purpose of the present paper, I have ventured to give it entire.

Case of Epilepsy, by B. W. Newnham, Esq.

"Mary Soane, æt. 17, has been the subject of epileptic fits for the last eight years of her life. Her general health has not suffered materially, but the faculties of her mind have been greatly impaired. When she has complained at all, it has been of the stomach; her appetite was capricious, voracious, or extremely bad. She has menstruated regularly, her bowels have been in a natural state, and she has never complained of the head. In her last illness, the only symptoms were a frequent return of convulsions, and extremely irritable state of the stomach.

She vomited incessantly bilious matters, and was also purged; she took scarcely any nourishment, lingered for eight days, and expired May 8th, 1816. The pupil in her last sickness was somewhat dilated and sluggish, but not in a very marked degree. The breathing was oppressed, but not stertorous. The body was inspected twenty-six hours after death: the viscera of the abdomen were perfectly healthy, not a vestige of disease could be traced in the liver, spleen, pancreas, stomach, or any part of the alimentary canal. The body was fat and well nourished; the viscera, the uterus, and its appendages were perfectly healthy; the lungs and heart were in a sound and healthy state, except indeed that the latter was much loaded with fat, and in the former, on the left side, were discovered a few transparent vesicles, containing air simply, and standing protuberant from the general surface of the lungs: these vesicles have been described by Baillie in his Morbid Anatomy, and I shall therefore content myself with referring to that work. The face and neck were blackened, and greatly discoloured; a considerable quantity of blood flowed from the vessels of the scalp as I was dissecting off the integuments. The following morbid appearances were observed within the cranium: the dura mater adhered most firmly to the inner surface of the skull, and required a great deal of force, more than I could employ, to detach it; this was with difficulty accomplished—the dura mater was much thickened. Between the dura mater and tunica arachnoides a very considerable quantity of water was accumu-

lated, probably about five or six ounces, and this was likewise found in all the convolutions of the brain. The veins of the brain were gorged with blood in many spots, the pia mater exhibited a blush of inflammation, and its whole surface was thickly studded with innumerable little granules of coagulable lymph. A considerable quantity of water was likewise found in the ventricles and at the basis of the brain. The brain was by no means unusually firm, and in other respects was as healthly as possible.

"The principal expression of disease was that of excessive determination of blood to the head, and it is extraordinary that so little derangement of the system had been occasioned by the progress of so considerable a deviation from a healthy state. It is worthy of remark, that the seat of nervous disturbance was in the brain, while the effects were manifested principally on the stomach and abdominal viscera; this was evidently not a case of sympathetic affection of the brain from abdominal disturbance, since the latter was only a consequence of the former."

An interesting question arises, out of these cases in which both carotid arteries were tied; viz. what influence have they (the carotid arteries) over the brain in a state of health. Conceiving that the growth of the brain would be in some measure checked by tying them, I tried the experiment on two very young pups, of different ages, but I could not perceive that in either it produced any effect. It is evident from Pancott's

case, that an increased flow of blood to the head is not a sine qua non of epileptic fits. Here they occurred after both carotid arteries were tied. Would not ligatures to these vessels prevent the epilepsy from terminating in effusion on the brain?

Cox, the epileptic patient whose carotid artery was tied on the 4th February 1831, and the case published in the 5th volume of this Society's Transactions, has not had had any return of the fits since the operation, and is in perfect health. Rochford* has regained in a great degree the use of the paralytic arm, and has for upwards of a year been free from any pain in it. He can walk four or five miles a day with the assistance of a stick; and although a hard drinker, continues in good health. In one case of epilepsy, this operation proved entirely ineffectual. The patient was a tall, thin, nervous subject, of very dissipated habits, and had suffered from the disease eight years. Both arteries were tied, with an interval of a month. The day following each operation he had an epileptic fit, not differing in any respect from those he had previously. He had always suffered from pain and heaviness in the crown of the head, which affections were temporarily removed by each operation.

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* Vide Transactions Medical and Physical Society of Calcutta, vol. v. p. 350.

CASE OF TETANUS

FOLLOWING

A PUNCTURED WOUND IN THE FOOT,

CURED BY

DIVISION OF THE POSTERIOR TIBIAL NERVE.

By J. MURRAY, M. D.

Presented 2nd February, 1832.

The following case of Traumatic Tetanus, occurred on board the ship *James Patterson*, in which I was a passenger from England to Calcutta ; and may be deemed worthy the notice of the Medical and Physical Society. The patient, Mr. W. Pyle, a midshipman, aged 15, trod on a rusty nail, and received a punctured wound of the left foot between the Metatursal bones of the great toe and adjoining one, on the evening of the 14th August, 1832, at 9 P. M. This officer kept his watch during the night, which was rainy and cold, and he suffered much pain in the wound. Thirteen hours after the infliction of the wound I was consulted on this case by Mr. Leslie, the surgeon

of the ship, and learned from him that when he first saw the patient at 8 A. M. he complained of a stiffness about his jaws and throat, which had increased very much since that time. His countenance was anxious, and his lips appeared swollen and rather livid. A poultice to the wound was all the treatment that had been employed. On consultation, the following draught was agreed to be given :

R. Pulv. Camph. ʒss.
Tinct. Opii, minim. lxx.
Syrupi Simp. ℥j misce, statim sumend.

As the jaws were nearly closed, and great difficulty found to get them opened to the extent of a quarter of an inch, a piece of wood of that thickness was inserted between the teeth.

Half an hour after taking the draught, he was visited again ; but no beneficial effect had resulted from the opiate. The Tetanic symptoms were rather increased, the spasms had partially extended to the muscles of the neck, and the piece of wood was deeply indented by the teeth. The countenance was extremely anxious, and covered with a cold perspiration. The limb was cold, and he said " it was dead, and that he had little power of moving it." His pulse was 120, and what may be called irritable, and his situation altogether seemed to be one of great danger. He was ordered to be carried to one of the best cabins, and after considering all the different modes of treatment that have been usually

employed and recommended in Tetanus, and finding how indecidedly they were all spoken of, as to affording hopes of cure, I proposed to Mr. Leslie the division of the Posterior Tibial Nerve, (by which the injured part was supplied,) as a remedy that held out a good prospect of success, from its effectually cutting off the communication between the source of irritation and the brain, at the same time that it was an operation easily performed, and unattended with danger or deformity. I proposed also that the original wound should be dilated and cauterized. My proposals being agreed to, so soon as the necessary preparations could be made, the operation was performed. A straight incision, an inch and half in length, was made through the integuments and the aponeurotic fascia, about an inch posteriorly to the Malleolus Internus, which laid bare the sheath of the vessels; and on dissecting deeper, I easily found the nerve in its usual position. By an aneurism needle, I separated and raised it, so that I might divide it with greater facility and expedition. When thus brought into view, it appeared to us so remarkably large, (being nearly twice the usual size,) though of the natural colour, that a doubt was expressed by Mr. L. about its really being the nerve. To satisfy him on this point, I requested the patient to extend his foot, which he did with difficulty, and in an imperfect manner, as he said he had lost the power of moving it; but he did it sufficiently to show the difference between the nerve and a tendon, as it did not become tense in this action. The

nerve was then rapidly divided by a single cut of the scalpel, which gave great pain, and although he could not articulate distinctly before, on account of the closed state of his jaws, he *immediately opened his mouth with an exclamation;* on looking at his countenance, I was astonished at the striking change in it for the better. I asked him how he felt, and he said "he was already much better, and that his leg had come to life again," and expressed at the same time a great inclination to go to stool. There was scarcely any hæmorrhage from the wound, which was then simply dressed by bringing the edges of it together by adhesive plaster, with lint and a bandage over it. We then dilated the original wound made by the rusty nail, which also (rather unexpectedly) gave acute pain; but we did not cauterize it, as proposed, the symptoms having already yielded;—a poultice sprinkled with laudanum was applied over it. His bowels were copiously moved, and on being placed in bed, he fell into a sound sleep, (without any additional opiate,) which continued without interruption for four hours, and awoke very much relieved from all his former disagreeable sensations. His jaws still however felt rather stiff, but, on strong exertion, he could open them nearly to the full extent. The excessive pain in the original wound, of which he had complained previously to the operation, had entirely ceased, and the motion of the limb was now quite restored. It was found, on examination, that the heel and sole of the foot were quite benumbed, but the sense of

feeling in the upper part was not affected. At night he got the following powder:

Pulv. Opii gr. ii.
—— Camphoræ ℈ i.

August 16*th*.—Slept indifferently during the night, complained still of stiffness of the jaws and neck, and to a greater degree than on the preceding evening. He had also pain and tightness across the chest, with head-ache. I was very sea-sick, and in bed by this time, and unable to make more minute inquiries about the symptoms; but I recommended V. S. and another opiate to be given. He was bled accordingly, to the extent of twelve ounces, which induced syncope, and gave great relief; and he got the same opiate as last night; after which, he slept a good deal during the day, and his bowels were naturally opened; the opiate was repeated at bed time.

Aug. 17*th*.—The opiate of last night appeared to produce considerable excitement for some time after it was administered, but this was followed by sound sleep; the stiffness in the jaws and neck, and the tightness across the chest, have nearly altogether disappeared. He complains of a good deal of numbness in the leg and foot, pulse 80, natural. Tongue clean; bowels regular.

Repetatur Pulvis h. s.

Aug. 18*th*.—The Tetanic symptoms have entirely disappeared. The numbness of the leg has gone off,

and he complains of pain in it, extending from the knee downwards; the parts in the site of the operation are very tender and extremely painful on pressure; the original wound continues to be poulticed and looks healthy. The opiate powder to be repeated in half the former quantity.

From this date no unfavorable symptom appeared, the wound in the sole of the foot healed in a few days, that of the operation did not unite by the first intention, and did not heal till about 14 days afterwards. The feeling began to return in the sole of the foot on the third day after the operation, and is now nearly natural in most places; but there is still up to this date an entire want of sensation in the little toe, and heel. He complained for some time of not being able to perform the action of separating the toes so easily as formerly; but that no longer exists, and he finds no inconvenience whatever in walking or going through all his regular duties: in fact, he is quite well.

Remarks.

I have thought the above case worthy of notice, from the result of the usual modes of treatment in this disease, as given by our best authors, having been so generally unsuccessful. Hennen, whose experience in it must have been great during the Peninsular war, says, "Happy should I be if I could afford anything satisfactory on this complaint, but in truth my observations have tended more to show me

what I could not trust to, than what I could place the smallest reliance on, when the disease was once fully formed :" he further adds, " I have never been fortunate enough to cure a case of the acute symptomatic Tetanus." I think it important to notice, that he mentions, that in one case, he found on dissection, the nerve connected with the injury to be thickened, seeing this appearance was so remarkable in the instance I have here recited. The lengthened account of Tetanus in Cooper's Surgical Dictionary, which I consulted at the time, rather bewildered me as to the treatment to be followed, and only showed the great difficulty to ascertain, amongst numerous discordant accounts, what practice seemed to have been attended with the least ill success : " nothing," he says, " is a more certain proof of our not being acquainted with any very effectual method of treating a disease, than a multiplicity of remedies recommended, which are as opposite as possible in their effects." I decided upon following the indication which seemed to me the most rational, and not to adopt any plan, or to use any remedies proposed, on empirical principles, seeing how unavailing they had mostly all been. I am only aware of one instance in which the communication was cut off between the wounded part and the sensorium, by a suitable *division of the nerve supplying the part.* It is one adduced by Baron Larrey, and as in that instance the operation was followed by a similar result to the present, I am surprised that the hint never seems to have been taken from it, and followed

up by others. Amputation has frequently been performed with the same view, but has seldom succeeded, probably from having been too long delayed; and I would ask why such a severe and *maiming* operation should ever be thought of or persisted in, when the same object can be so much more readily and scientifically attained *by a simple incision?* We are told that when the disease invades very quickly, the danger is always greater than when it comes on at a more distant period from the receipt of the injury. In this case its attack was very early, and the progress of the symptoms rapid; and I have no doubt, that it would soon have run its course to a fatal termination, if it had been left to the sanative powers of nature alone, or treated in the usual manner; but very little time was lost in having recourse to the operation, which proved a remedy of immediate and effectual power, after the disease had decidedly formed; and I think it may have been of the greatest consequence, that it was resorted to so soon after Trismus appeared.

Calcutta, 24*th Feb.* 1833.

OBSERVATIONS

ON

DRACUNCULUS.

By C. MOREHEAD, M. D.

Presented 2nd Feb. 1833.

Having lately had an opportunity of seeing Guinea-worm, on an extensive scale, in the hospital of H. M.'s 4th Light Dragoons at Kirkee, I feel induced to offer some remarks upon the subject. It is not my intention to trace the medical history of the disease, that has already been very ably done by Drs. Smyttan and Bird, in the Transactions of the Society, and I do not know that the result of my observations in the hospital of the 4th Light Dragoons, could add much to the accurate histories of these gentlemen. However, such remarks as I find in my notes worthy of record I shall subsequently notice.

My object in the present paper is, principally to record some views which have occurred to me regarding the localities in which Guinea-worm prevails, to shew

reason for believing, that were the subject investigated in the spirit which should direct every such inquiry, that much interesting and probably useful information would be the result. At present the matter rests thus: we have accounts of the disease, as it has prevailed in Grenada, and in a few military stations in this country; but when it is taken into consideration, that it is one annually endemic in a very great number of the villages of the Deccan and northern Concan, and that of the nature of these localities we are very imperfectly informed, it must be evident that any attempt to connect the relation of events as observed in any one or two situations, cannot be otherwise, when applied to the whole, than a vague speculation, a deduction of general principles from a most partial observation of facts. Chisholm framed a theory which was sufficiently plausible in Grenada, but had he been acquainted with a few more affected localities he could not have entertained it; and such indeed must be the legitimate result of every research similarly confined. It would be better to remain silent, than to fritter away our ingenuity in coming to conclusions when so deficient in the necessary means. I shall not discuss the probability of ova entering the pores of the skin, or from the stomach getting into the circulation; in the present state of our knowledge, such investigations are surely beyond our intelligence.

The only way of acquiring useful information on the subject, is not by indulging in such discus-

sions, but by accurately observing the different localities in which Dracunculus is annually endemic, and by noting every circumstance which can possibly be supposed to bear relation to the subject; such as the geological structure of the affected site, the nature of the soil, the nature of the wells, the rock in which sunk, the abundance or scarcity of water, the seasons of increase and decrease of the disease, the opinions of natives, &c. Such information, collected at all affected localities, and compared the one with the other, would in all probability lead to the cognition of certain features of resemblance, certain coincidences of circumstance in the affected localities, which it would be legitimate to consider as standing in some relation to the disease, though it might not be possible to point out in what that relation consisted. In the present state of our knowledge, it is absolutely impossible to form any idea of how nearly by such research we might approach the subject, and within what narrow limits bind its discussion. Without it, however, it is clear that we are not entitled to go beyond the threshold.

From what I have myself seen of the disease, and from what I have learned by reading and conversation, I think that I recognize a feature common to all the affected localities; but as it is impossible to command any thing like full information upon the subject, it is sufficiently probable that it is only the small extent of my information which gives plausibility to the following remarks, and that I am mere-

ly acting over what I have already reprobated in others. Before I was acquainted with the views of Chisholm, it appeared to me, that did we connect the disease, with any external species of worm whose habits were to love moist places and live in the mud; that nothing was more probable, than that the presence or absence of such external species might depend upon the nature of the rock, soil, and geographical situation, exactly as plants are influenced in their habitats by such circumstances.

Chisholm attributed the disease to the wells in the affected estates in Grenada, being sunk in a rock of igneous origin, and to their water being impregnated with saline particles, and on this latter condition he lays the principal weight.

The saline impregnation cannot have influence in affected villages in the Deccan, where it does not exist; but I believe that the former part of Chisholm's views, is to a certain extent correct. I believe that all the localities in which Dracunculus prevails, are in districts the rocks of which are of the secondary trap series, i. e. rocks reputed by geologists to be of igneous origin. I shall shortly state the grounds on which I entertain this opinion, by, in the first place, noticing the different localities on which according to my information the disease prevails, and then by stating to what extent I am informed regarding the absence or presence of trap rocks in these localities. I should have wished to have added the weight of

personal authority to a greater number of the statements which follow ; but since I do not see any prospect of having an opportunity of doing so, I must leave to others their verification or refutation. I am only anxious that views, which appear to me to open up a new and interesting feature in the disease, should have the advantage of full investigation.

In Chisholm's paper, in vol. xi. of the Edin. Med. and Surg. Journal, we are informed, in a quotation from *Dubois*, that Dracunculus prevails in many districts in the Carnatic and Madura, to within the distance of one or two days' journey from the coast. Of the geological formation of these districts I do not possess any information. Dr. Scott, of Madras, (17th vol. of Edin. Med. and Surg. Journal,) tells us, that the men in whom he had met with the disease, were from the banks of the Toombuddara and Mahratta country. It is probable that it is somewhere about the latitude of the Toombuddara that the secondary trap series commences, which, extending northward subsequently, forms the table land of the *Deccan*. I have verified the trap rocks at Belgaum, but have no accurate knowledge of the geology of the intermediate country. In the Deccan the disease prevails in the villages about Beejapoor, Sholapoor, Akulkote, Meritch, Tazgaon, Fultun, Baramuttee, Jejooree, Poona, Ahmudnuggur, Aurungabad, Jalnah, and I believe Nagpoor: all which places are districts of the secondary trap formation.

The country between the western Ghauts and the sea coast, from, I believe, Cape Comorin to some where about the latitude of the Bancoot river, is composed of a conglomerate rock, with a red vesicular iron-shot clay basis. Sometimes the imbedded masses are few, and the rock then consists principally of the red iron-shot clay.

This rock I have verified at Vingorlu, the foot of the Ram Ghaut, Malwa, Jyghur, and also extending over the table land of the Mahabuleshwar hills. At Vingorlu this rock rests on granite, syenite or other primitive rocks. At Mahabuleshwur it rests upon a table of basalt. As far as my information goes, Dracunculus does not prevail, or at least is very rare, throughout these red conglomerate districts.

Somewhere to the north of the Bancoot river and to the south of Bombay, the red conglomerate disappears, and the trap rocks taking its place extend throughout the northern Concan ; and now Dracunculus again appears, for example, at Bombay, Matoonga, Bewndy and Damaun. It would appear that about the latitude of Bancoot, Mhar, and the Mahabuleshwur hills, there is a most favourable field in which to obtain imformation on this subject, because to the eastward and northward we have trap districts, and it is probable that previous to the total disappearance of the red conglomerate, there are tracts in which the trap rocks more or less prevail. At all events there must be villages at

no great distances, some in the red conglomerate tracts, others in the secondary trap. By comparing these with reference to Dracunculus, we might anticipate some information, either in confirmation or refutation of these views. I trust at some future time to have an opportunity of throwing further light on this.

Dracunculus, I believe, is occasionally met with in the districts around Neemuch. The secondary trap rocks of the table land of Malwa, nearly approach these districts. In the 2nd vol. of Col. Tod's work on Rajpootana, it is mentioned that Dracunculus is very prevalent in some parts of Marwar : but as I have not at present an opportunity of consulting the work, I cannot be positive as to the facts, nor do I possess any information regarding the geology of these districts.

It is well known that Dracunculus prevails in parts of Western Africa ; but we are so ignorant of the localities and of the geology that all we can say is, that Dracunculus prevails somewhere in these regions, and that rocks of the secondary trap series also occur, without making any attempt at instituting a relation between the events.

From the table it will be seen, that the months in which the disease is most prevalent at Kirkee are March, April, May, June and July.—September, October, November, December, and January may be looked upon as exempt.

As far as I can learn, the same fact is observed in all the affected localities in the Deccan. It is a native opinion that if the worm do not escape one season, it remains dormant till the next season of escape. I made many inquiries for the Gordius at Kirkee, but it was not known to the villagers, and I could never obtain a specimen. The 4th Light Dragoons never suffered from Dracunculus at Kaira; they arrived at Kirkee on the 14th February, 1827. The following table is a history of the disease, as it has affected the regiment at that station.

	January.	*February.*	*March.*	*April.*	*May.*	*June.*	*July.*	*August.*	*September.*	*October.*	*November.*	TOTAL.
1827	...	...	...	...	...	...	...	...	...	...	...	...
1828	...	...	...	...	3	3	2	...	...	...	...	8
1829	...	1	2	...	3	...	...	...	...	...	...	6
1830	1	...	5	5	2	1	3	1	...	...	...	18
1831	...	...	...	1	2	...	1	...	...	...	...	4
1832	...	1	5	7	57	64	48	26	3	...	...	211

Of the 211—72 were admitted a second time and 6 a third time, so that the total amount of men affected was 133.

In 1832, the increase of the disease is most striking:—to what are we to attribute this remarkable difference? It would seem as if something which we cannot recognize had been superadded to any local and annually acting cause. It remains however to be seen, whether the occurrence was merely casual, or one henceforth to be of annual repetition. The

cause of the sudden increase I shall leave unattempted. I incline however to the anticipation of the annual prevalence of Dracunculus to a great extent at Kirkee. In all the surrounding affected villages, the amount of diseased does not vary in any very striking degree in different years; and I see no reason to expect that the features of the disease should change, when once established in the cantonment. Much more could be said on this part of the subject, and much could be said regarding the regularity in the periods of increase and decrease of the disease, but I do not see that, in the present state of our information, such discussion would lead to any stable result.

The numbers of admissions from the different troops of the regiment varied much, though there was nothing in the respective circumstances of the troops to which we could attribute such difference. There were very few of the women affected with the disease: none of the officers and none of the children.

I shall now record such observations made in the hospital of the 4th Light Dragoons as appear to me worthy of note. When the disease began to prevail so extensively, the men were instructed to examine their legs; and then many came to hospital, in whom the only indication of the worm, was a waved substance under the skin, resembling to the feel a piece of whip-cord, very generally unattended by any sense of uneasiness or any consciousness

of the existence of any thing anormal. A common practice was, to cut down by the side of this substance, and having exposed the worm to pass a piece of thread underneath it. I shall speak of this method of treatment subsequently. There have been several cases in which, after the worm had been felt like a cord under the skin, it remained dormant for three weeks or a month, was then reported, cut out, or came away in the natural course. The men suppose that the worms shift their places, that they have been felt in the thigh, and finally been cut out at the foot. There is no doubt that sometimes the corded feeling is distinctly discovered, and found wanting the following day, but whether ever without any return I do not know.

Before the men's attention was directed to examine their legs, a blister was most generally the first symptom, frequently preceded by sense of itching and swelling without pain or redness. Such mode of commencement is most commonly observed in the foot. I have seen the itching and colourless swelling not followed by a blister, but by a small abscess. In many cases the appearance of the blister, the swelled foot, &c. has been sudden; for example, the patient going to bed without any indication, and awaking with these symptoms in the morning. In many cases, after the appearance of the blister it is long, sometimes weeks, before the worm appears;

the swelling decreases, the foot becomes well, the ulceration nearly healed, and after all the worm generally comes away at the site where the blister had been, and where a small callous opening had remained. If the blister be an indication that the period of escape has arrived, how is it so long delayed? The opinion has been entertained by Mr. Wilkins of the 4th Light Dragoons, that the contents of the blister may in part be a discharge from the tube of the animal. The opinion is sufficiently plausible, and it may be that the irritation subsequent to breaking the worm, may be caused in part by a similar discharge from the ruptured ends.

In some cases a pimple is the first indication: in some a small ulceration. In these latter, perhaps, the epidermis had been rubbed off. In a few cases inflammation and swelling ending in an abscess: the worm coming away at the orifice formed in the abscess, no blister having preceded. The pain, phlegmonous swelling, inflammation and suppurations, generally take place after part of the worm has come away, having been broken, and a portion remaining fixed.

I cannot verify the remark made by Dr. Bird, that the thickness of the worm is proportioned to the fleshiness of the part from which it is extracted; I have seen large ones taken from the toes. Their frequent smallness in that situation is apparently

owing to their being frequently broken, and consequently, discharged in fragments. In those cases in which the worm has been described as resembling a horse hair, I have observed that for the most part it comes out in small quantity; or as the men describe it, "*like water.*" It is in fact as if the fluid contents were in a much thinner tegument than natural: the contents escaping, leave this their collapsed tegument, in appearance like a horse hair. May this not be the intestine of the worm, which by some means separated from the external tegument escapes alone? In the case in which I particularly studied this appearance, there was no inflammation during the escape of the worm in the above way: but it afterwards came out of great length, and apparently of usual thickness; was broken, and then swelling and erysipelatous inflammation of the foot followed. Moreover I may remark, that I have seen in one case where the external tegument of the worm was cut in attempted extraction, the intestine escape in very numerous convolutions; which convolutions combined in the formation of a globular body, the size of a small olive, and protruded beyond the wound. The tegument of these convolutions resembled, in every respect, the tegument of the worm when discharged in the manner above described. In that case, in which the resemblance to a horse hair was most striking, there was on the metatarsus, near the orifice of escape, a small lump, which had not existed

many days, and which disappeared when the worm escaped. May we suppose any affinity between the actual state of that lump and the conglomeration of the convolutions, as described above, in the case of attempted extraction ?

In two cases where the only indication of a Dracunculus was the corded feeling, which was cut down upon by Mr. Wilkins, and the worm raised in a loop of some length by means of a probe, I have observed active contortions and writhings of the animal, and retraction of a considerable part under the skin. In one of these cases the head came out, with three or four inches of the worm, which was transparent ; it writhed actively, and about two inches of it, re-entered the skin on the withdrawal of the tracting force. Similar proofs of vitality have been still more frequently observed by Mr. Wilkins, by whom this method of extraction was extensively and ingeniously employed.

As extraction was so extensively practised, our opportunities of seeing the entire worm have been great. One end is sharp and pointed, the other terminates in a small hook. This hooked extremity is described by Cuvier as the tail, and is looked upon by that naturalist as the generic mark of Dracunculus.

I do not find in my notes any remark regarding the end which in general was the first to escape

Writing from recollection I should say, that the sharp and pointed extremity was generally that which appeared first.

The worm when first removed by extraction is lax, not elastic nor stiff, very generally quite clear and transparent: the milky opacity and stiffness quickly follow exposure to the air or plunging the worm in water. The opacity depends on a change in the contents, because those squeezed from an opaque worm, quickly extracted, were of a cream colour. The empty tegument was transparent, tough, and when stretched, resembled coarse fishing gut. Though the above changes are very common, still there are very many exceptions. I have seen worms opaque and lax at the very moment they were pulled from underneath the skin. The largest worm I have seen was extracted from the scrotum, and several hours after extraction it was quite transparent and very stiff and elastic: it had at one end two small viscous-looking bladders, which I have never seen in any other specimen. These exceptions contradict an opinion I was at first inclined to hold; that the opacity and the elasticity were to be attributed to the same cause, viz. to some alteration in the consistency of the contents.

From the above it will appear, that Dr. Smyttan is not altogether correct in using the appellation of *Gordius Lacteus*. I shall not attempt to account for

these differences in appearance on first extraction. There extend longitudnally, the whole length of the worm, two streaks sufficiently distinct in colour and transparency to be easily observable. From these streaks the fibres probably take their origins and have their insertions.

A small transverse section, divided into two portions by a longitudinal section through the streaks: one piece put into the glass-box of a small microscope, the external tegument towards the eye; when viewed through a 6000 magnifying power, exhibited the following appearance. Fibres round, transparent, silvery, distinct, separate, slightly tortuous, arranged longitudinally, somewhat less to appearance than a horse hair. The inner coat exposed to the eye, and viewed through the same magnifying power. The longitudinal fibres seen distinctly, but as if either connected with a tissue of transverse and otherwise distributed fibrils, or seen through a coat composed of a tissue of such arranged fibrils.

The view of the external tegument was also seen by Dr. Macleod, Deputy Inspector General of King's Troops, and both views by Dr. Preston of the 4th Light Dragoons. We were never successful in obtaining a good microscopic view of either end. In such as we had, I never could distinguish anything like an opening. There is room here, however, for more accurate investigation. For the following statement, I am in-

debted to my friend Mr. Forbes, of the 1st B. N. I. the head (i. e. the extremity without the hook), of a Guinea-worm, with about half an inch of its length protruded from the anterior and lower part of the leg of a seapoy. The worm could be felt like a cord under the skin, and extended for a considerable distance upwards, on the anterior part of the leg. The seapoy pointed out to Mr. Forbes, that on his rubbing and pressing the seat of the worm, from above downwards, as the pressure approached the site of protrusion, a small quantity of milky fluid was ejected in jets from the protruded extremity.

I shall conclude with some remarks regarding the mode of extraction which was extensively adopted by Mr. Wilkins. It was the practice of that gentleman, when he found the worm like a cord under the skin, and previous to any other indication of the disease, to select a favourable situation and cut with a lancet parallel to the worm, and on exposing it, to pass a thread underneath by means of an eye-probe. Where the part was fleshy, and also in many cases about the ankle, the extraction was speedily effected, sometimes in less than an hour, and the patient was cured. In others, however, the plan was not so successful: the worm remaining fixed, or breaking, and giving rise to inflammation and suppuration.

Upon the whole I am not convinced that much advantage is to be gained by this mode of treatment.

In estimating the question we must not forget, that the subjects for extraction are men, who might be weeks at their duty, before any inconvenience was excited by the natural efforts of the animal to escape. So that in cases where the extraction has been unfavourable, we have men in hospital who otherwise would have been efficient, and who, when the disease pursued its own course, might possibly not have been the subjects of painful symptoms. On the other hand, we must not forget, that in many cases, the disease is much more speedily got rid of by extraction than is general by the natural course; and also in the natural course of discharge we frequently have painful inflammation and tedious suppuration. So that possibly where one extraction has been unfavourable we have merely anticipated symptoms to which the patient would subsequently have been subjected; have merely anticipated the non-efficiency of the soldier, not augmented it. In short I do not come to any conclusion, but look upon the subject as open for further investigation, which, however, must be on an extensive scale, and conducted with the view of elucidating the point. I must however add, that Mr. Wilkins thinks much more favourably of the system of extraction than I do, and that his opportunities of observation have been much more extensive than mine.

Bombay, January 6, 1833.

ON LITHONTRITY

IN

INDIA.

By J. N. CASANOVA, M. D.

Presented 6th October, 1832.

It appears that medical men in Europe formerly believed urinary calculi to be unknown in India, or of such rare occurrence, that those morbid deposits from the urine which are common in other parts of the world, both in the bladder and in the pelvis of the kidney, were seldom suspected to exist, either among Europeans or Asiatics in British India. It is but reasonable to infer, that the result of this conclusion may have occasioned errors in practice, as calculous complaints when existing, must have given rise to symptoms which were ascribed to other causes, and these disorders may have been overlooked, or an improper treatment followed; under which the unhappy patient must have languished, while the real nature of his malady was not recognized.

The zeal and scientific researches of the Members of the Calcutta Medical and Physical Society, have already demonstrated the frequency of urinary calculi in Asiatics, as well as in Europeans in Bengal; and our archives and museum not only contain abundant proofs that these diseases are very common in India, and very similar to the same class of disorders in Europe, but prove the skill and dexterity of the Surgeons of the H. C. S., in achieving with success, one of the most difficult and dangerous operations in Surgery.

The substitution of Lithontrity in place of Lithotomy has been sufficiently approved in Europe*, and it is probable, that the first named operation may in the majority of cases be preferable to the knife or gorget, for the removal of stone in this country; where it is acknowledged, the great operations of Surgery are more hazardous by reason of the climate, and where the timidity of Asiatics is often an insuperable obstacle to the use of the knife. Having had recourse to Lithontrity with success, and brought with me a complete apparatus made according to the instructions of Civiale in Paris, I resolved to try it in the first favourable cases that might occur in this country; and as I am not aware that the operation of Lithontrity has been previously performed in Bengal, I trust the two following cases

* See Dr. Civiale "de la Lithotritie, Paris, 1826," and Dr. Segala's Observations, Paris, 1831—2.

may not be uninteresting to the Medical and Physical Society of Calcutta.

Case 1.—Josephine, a native of Madagascar, about 43 years of age, of large size and rather fat, applied for my advice regarding sufferings referred to the urinary bladder. She had been six years in Calcutta, and during the greater part of that time had been afflicted in a severe degree by the usual symptoms of urinary calculus. On sounding I found a stone in the bladder, which appeared to be of large size and soft texture. On the 7th April, 1832, I operated with Mons. Civiale's apparatus, and found the stone of large size, the scale on the shaft of the instrument indicated a circumference of four inches ; it was easily perforated, and after the lithontriteur had passed through its centre, it appeared to me that the mass was broken ; several considerable pieces, and a large quantity of sand, were voided in the course of the afternoon, and were brought with a portion of the urine in a pan, for the inspection of the Society at the meeting of that date in the evening. On examination by J. Prinsep, Esq. this detritus proved to be composed principally of the carbonate and phosphate of lime. By two subsequent operations with the apparatus of Civiale, at intervals of four days each, I completely ground down the pieces into which the stone had separated on the first trial; and quantities of sand, with fragments half the size of a small pea, were voided daily.

The whole quantity of detritus collected, amounted to ʒviiss; and it may be presumed that some sand passed on occasions when the urine could not be examined. This patient still remains in Calcutta; she is in good health, and is completely relieved from any symptoms of disorder connected with the bladder. Her cure was accomplished in eleven days.

Case 2.—Mr. S., a resident in Calcutta, aged 31 years, first experienced symptoms of Dysuria in February, 1829, which were ascribed to cold, and treated as a slight spasmodic affection of the bladder. Subsequently some uneasiness about the pelvis was experienced, attended with more frequent calls to urine than usual, which was not voided with the usual freedom, but sometimes in an irregular and feeble stream, at other times guttatim; an uneasiness was then felt at the anus, and sense of weight in the perineum, much aggravated on going to stool or on riding in a buggy. A dull pain was now almost constantly present at the root of the penis and along the urethra, as well as in the loins; and on one occasion of severe suffering some clots of mucus were voided: these when dried, were found to contain a yellow sandy powder, which gave reason to suspect a lithic diathesis, and some alkalies were taken with apparent benefit, causing increased flow of urine with a copious white sediment, followed by considerable relief; bougies of various sizes were also used.

The above is an abstract of a long written report drawn up by the patient himself; which is now placed before the Society, together with a diary kept by him during the progress of cure, shewing the effects of the different sittings or operations, and the comparatively slight degree of pain which he underwent by the application of Civiale's process.

On the 30th May, 1832, this patient's bladder was explored in presence of Dr. Duncan Stewart, and the existence of the calculus ascertained, which when seized by the litholabe appeared to be about the size of a common walnut. On the 4th June Civiale's instrument was introduced, and the dimensions of the stone accurately computed; the circumference indicated by the scale on the shaft of the instrument was three inches and $\frac{6}{10}$. Nothing further was attempted till the 15th June, when the stone was seized and subjected to steady action of the lithontriteur for about five minutes, with evident effect. In the course of the next four days, the urine was strained, and 60 grains of gravel collected; very little pain or inconvenience attended or followed this operation.

June 19th.—Under an operation of about four minutes the stone appeared to separate into two or more pieces, and the instrument was withdrawn. Fifty grains of sand were collected between this date and the 25th.

June 25th.—A portion of the stone was quickly seized, and in about eight minutes ground to powder; in the course of the next four days, the sand deposited by the urine amounted to 140 grains.

June 29th.—A large fragment of stone was still remaining in the bladder, and it was on this day subjected to the action of the instrument for about 12 minutes, after which 50 grains of sand were voided in the course of the afternoon: on the next day 35 grains more of the detritus came away; on the 1st July 28 grains, and on the 2nd, 25 grains; on the 3rd, 10 grains, and on the 4th, 3 grains. After this, the urine became clear of sand, and the secretion of mucus from the bladder quickly subsided.

Recapitulation of quantity of calculous matter collected after each operation: on occasions of going to stool some urine probably was voided, containing sand, the amount of which cannot be estimated.

		Grains of sand.
June,	15th	60
,,	19th	50
,,	25th	140
,,	29th	50
,,	30th	35
July,	1st	28
,,	2nd	25
,,	3rd	10
,,	4th	3
		401

On analysis by Jas. Prinsep, Esq. of the H. C. Mint, this sand proved to be composed of lithate and fusible calculus in about equal proportions. I have preserved, as a curiosity, this patient's account of the effect of each operation; and his statement of the slight degree of pain suffered during the operation, or of inconvenience that followed on each occasion, may prove to the Society, that the cure of a common stricture is often productive of as much inconvenience as was in this case caused by these operations, which have proved an effectual and complete substitute for one of the most dangerous operations in Surgery. This patient is still in Calcutta, and ready to give any information that may be desired relative to the facility and success of the operation.

We may agree with Dr. Thomas King, that in the majority of cases, nay in almost all ordinary cases of stone in the bladder in adults, the operation of Lithontrity is advisable, and is capable of curing the disease (stone in the bladder), with the least possible pain, the least danger, and though perhaps not in the quickest manner, still its greater safety would, in all practicable cases, claim a preference over Lithotomy. We must acknowledge that in some cases of great disease of the prostate gland, in cases of stone engaged in a cyst of the coats of the bladder, and in very young children, the process of Civiale is not applicable. It is hardly possible to offer a stronger proof of the estimation in which the operation of Lithontrity is held by pre-eminent professional men,

than the observation at page 244, in the 19th No. of the American Journal of the Medical Sciences for May, 1832, where we find a statement that Mons. Civiale had operated on M. M. Dubois, and Lisfranc, with success. There are few medical men capable of forming a more just estimation of the comparative merits of the operations, Lithotomy and Lithontrity, than the two who have been just now named.

Calcutta, 4th October, 1832.

ADDITIONAL

CASES OF LITHOTOMY

ON

NATIVES OF INDIA.

By F. H. BRETT*, Esq.

Presented 6th Oct. 1832.

Having had occasion to perform the operation of Lithotomy frequently, since my first seven cases were published in the 5th volume of Transactions; I am induced to place the following brief statement of the subsequent operations at the Society's disposal, at the same time that I send the stones which were extracted, to be deposited in their Museum, should they be deemed worthy of a place in the increasing cabinet of specimens of *Indian* Urinary Calculi there collected.

After the able manner in which so much information on the subject has already been conveyed to the Society by others, I can communicate but little

* From obscurity of the MS. there was an error at vol. v. of Transactions, page 260, line 4, Mr. Brett's name being inserted *W. F. Brett*, which should have been *F. H. Brett*.

worthy of attention, regarding a disease, the frequency of which in India is so fully established. It only remains for me to remark, that the patients were cured by the ordinary lateral operation, and no other difficulties than those alluded to in the abstracts of cases occurred. Where the stones were large, a second incision of the neck of the bladder was generally requisite, otherwise the operations seldom occupied more than one or two minutes.

I have been unfortunate in losing four patients out of 22, but I have never rejected any that have presented themselves, where there was a possibility of relieving human suffering of so intense a character. Three of the fatal cases did not request my aid until their constitutions were completely exhausted by the protracted irritation. The unfortunate terminations (excepting the cachectic child No. 13), happened likewise in the hot season, when the weather was unusually sultry and unhealthy. Two of these were carried off by Tetanus, and one of the four fatal cases survived the operation a month, having been a martyr to the disease, *thirty years*.

In the last fifteen operations I employed merely a common scalpel, having lost the only beaked knife in my possession; and finding this single instrument simplifies the operation, I now generally prefer it to any other, having required no other instrument than the scalpel where the calculi were large, as in cases 15, 17, and 20.

In addition to the arguments other advocates have adduced in favor of the straight staff, (which is the one I always employ,) it appears to have one important advantage, which is that of lowering the prostate gland and neck of the bladder, towards the perinæum, when its handle is only slightly inclined towards the operator, and consequently he has not to cut so deep as when the curved staff is employed, that gland being very distinctly seen on completing the 2nd incision.

In most of these operations I have been aided by D. Gullan, Esq. Assistant Surgeon, 15th Regt. N. I. The cases are numbered in continuation from those previously published at page 260 of vol. v.

Case 8th. Peetum, aged six years; village of Dhukkea, near Shahjehanpore. A Hindoo of healthy constitution. The disease of five years' duration. The operation was performed on the 28th May, 1831: followed by Peritonitis and Tetanus, which left considerable debility, and protracted his recovery for two months. Weight of stone 120 grains; its composition is Lithate of ammonia, with a nucleus of Lithic acid. No. in the Society's collection, 35. This patient presented himself in August, 1832, continuing quite well.

Case 9th. Khosrum, a Hindoo child aged seven years, of tolerably healthy constitution; from the village Koolhurrea, zillah Bareilly; suffering from Urinary Calculus for one year, which was extracted on the 3rd Nov. 1831, weighing 175 grains. The urine flowed entirely from the natural passage on the 19th, and cicatrization was complete on the 21st. Stone consisting of Lithic acid, with a small external layer of the Ammoniaco-magnesian Phosphate. No. in the Society's collection, 39.

Case 10*th.* Jissooa, a Moosulman boy, about six years of age, and of robust constitution, residing at Moohumdie in Oude, and afflicted with the disease two years. Operated on 22nd Nov. 1831, and a Calculus extracted, weighing 175 grains. Urine flowed naturally on the 9th, and he was discharged within the month, having experienced no unfavorable symptom throughout. Composition of the stone Oxalate of Lime. No. in the Society's collection, 40.

Case 11*th.* Bhujjooa, a Hindoo boy, aged eight years, residing at B'hunnuari, six coss from Shajehanpore. Constitution healthy, and disorder of five years' duration; for the last four months his sufferings were very severe. Operation on the 19th Dec. 1831. Calculus weighed 102 grains, from which he convalesced remarkably well; the urine flowing by the natural channel on the 9th day. Composition of the stone Oxalate of Lime with some Phosphate. No. in Society's collection, 41.

Case 12*th.* Zoorra, aged 25 years, a Hindoo of Biloolpore, district of Shajehanpore, subject to Calculus Vesicæ for eight months, sufferings of unusual severity. Operation 21st Dec. 1831. Recovered within the month, without any unfavorable symptom.

The stone had been repeatedly struck by the sound, and distinctly felt by Assistant Surgeon Gullan and myself, both on former occasions, and immediately preceding the first incision. It was likewise felt by my fore-finger, on completing the section of the prostate and neck of the bladder, and discovered to be not so large as a bean, and rough. Owing, however, to its being afterwards enclosed in the folds of the bladder*, I failed in seizing it with the forceps. After carefully searching, alternately with the finger and forceps, in the usual manner, the latter guided by the former, I

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* Knowing the stone was small, I caused this patient to retain his urine, previous to operating, that I might the more easily detect it at that time, which accounts for the contraction of the bladder.

deemed it unnecessary to make any further efforts, feeling confident that the stone must pass out with the urine through so free an incision, which it accordingly did, on the following day, accompanied by a slight straining effort and pain in the wound. The Calculus was thrown away in the dressings, during my absence from the patient.

Case 13*th.* Munsa, a Hindoo child of the brahmun caste, aged 3 years and 9 months. He was not larger than other children of two and a half years. Village of Hirum, near Seetapore, Oude. His complaint had existed two years. The constitution had suffered severely from the disease commencing at so early an age, (when but one year and nine months old), this patient laboured under considerable irritation, pyrexia at night, tumid abdomen, and foul tongue, and was rickety. The outlet of the pelvis was unusually small, and the Calculus large, considering the size of the child, weighing 355 grains. After improving his general health by a long course of tonics, alteratives, iron, &c. &c. and taking the necessary precautions; the operation was performed on the 28th January, 1832.—There was severe Hæmorrhage. He became comatose, with rapid and small pulse, and died 16 hours afterwards. Lithic acid Calculus, with a small nucleus likewise of Lithic acid, more compact and laminated. There was also a slight trace of Oxalate of Lime. No. in the Society's collection, 36.

Case 14*th.* Goolamie, aged 4. Moosulman child. Village of Kumurea, eight coss north of Shajehanpore. Affected with the disease one year. Operation 28th Jan. 1832, and a small Lithic acid Calculus extracted, weighing 27 grains. No unfavorable symptom occurred, and he was discharged within the month. No. of specimen in the Society's collection, 42.

Case 15*th.* Motie Chuogun, a Brahmun, aged 60, of strong constitution. Symptoms of stone for 11 years. Lithotomy on the 14th April, 1832. Calculus of considerable size, rendering it necessary, after grasping it with the forceps, freely to enlarge the incision of the neck of the bladder, with the scalpel guided on the

finger. Went to his village 14 miles off, without my knowledge, on the 15th day, not wishing to be absent from home longer; returned in a few days afterwards with the wound completely healed. Weight of Calculus 1340 grains, consisting of Lithic acid nucleus, covered by Oxalate and Phosphate of Lime. No. in the Society's collection, 32.

Case 16*th*. Newla, a Hindoo, aged 12; village of Buhadoorpore. Disease of four years' continuance. Operation on the 26th May, 1832, the weather being for a few days mild and favourable. He did extremely well; weight of stone 316 grains. A compact Lithic acid nucleus, exterior of fusible Calculus. No. in Society's collection, 37.

Case 17*th*. Bhumma, a Hindoo, aged 18; village of Bhurgumma. Operation the 2nd July, 1832. The wound was large, to enable me to extract the Calculus with facility. It healed, however, within the month, and he did extremely well. The disease was of six years' standing, and the patient's sufferings very severe for the last four months. Weight 1340 grains. Composed of Oxalate of Lime, Lithic acid, and Phosphate of Lime. No. in the Society's collection, 33.

Case 18*th*. Ruhuman, aged 30. A Moosulman, native of Bareilly. Very ill from the disease for one year, and miserably emaciated. Having endeavoured to improve his general health, the operation was undertaken on the 11th July, as presenting the only chance of preserving his life. Not more than six ounces of blood were lost. He with great difficulty rallied from the shock of the operation, but recovered by Ammonia and brandy, having had a full dose of Laudanum before, and another after the operation. He remained much debilitated, but with great care, has now quite recovered. Weight of Calculus 120 grains. Composition, Oxalate of Lime, and Phosphate. No. in Society's collection, 43.

Case 19*th*. Minda, a Hindoo, aged seven and half years; suffering under the disease for six years. Operation on the 11th Aug.

1832, from which he entirely recovered in 30 days. The stone weighed 110 grains; its neck was embraced by the prostate gland, and the smaller part was lodged in the membranous part of the urethra. There is a smooth surface over which the urine appears to have flowed. Composition, Oxalate of Ammonia nearly pure. No. in the Society's collection, 45.

Case 20*th*. Jumahir, a Rajpoot, aged 14 years, and subject to the disease seven years, from which he suffered excruciating pain. Operation on the 13th of Aug. the Calculus weighing 1595 grains: he perfectly recovered at the end of the month. Composition Lithic acid nucleus, covered by fusible Calculus and triple Phosphate. No. in Society's collection, 34.

Case 21*st*. Lullarr, aged 23, a Hindoo; much reduced by the disease, which had tormented him for 10 years. The operation on the 13th Aug. was attended with nothing remarkable, and he rapidly recovered: the Calculus weighing 99 grains. Composition, Oxalate of Lime nucleus, exterior triple Phosphate. No. in the Society's collection, 44.

Case 22*nd*. Choaréya, a Hindoo boy, aged 9 years; afflicted with Urinary Calculus for four years; was operated on the 23rd of August 1832, and he recovered in about 25 days. The stone weighing 282 grains. Composition, nucleus Lithic acid, exterior Phosphate of Lime. No. in the Society's collection, 38.

Shajehanpore, 15*th Sept*. 1832.

LITHOTOMY

ON

NATIVES OF INDIA.

By R. N. BURNARD, Esq.

Presented, Dec. 3rd, 1831.

Cases of Stone in the Bladder in which the operation of Lithotomy has been performed by Mr. Burnard, *Surgeon to the Native Civil Hospital at the city of Benares, subsequently to the* 13 *cases reported in his communication at p.* 249, *Vol.* v. *of Transactions of this Society.*

These cases are numbered in succession from those in the former report.

Case 14*th.* Sheoraj, Moochee, aged 11 years, residing at the village of Pheoa, zillah Arrah. Operation on the 26th May, 1831; the stone weighed 70 grains, and is composed of Lithate of Ammonia and Oxalate of Lime; the patient was well on the 21st July. No. of the stone in the Society's collection, 52.

Case 15*th.* Keedoo Noorja, aged 13 years, a native of Secrole near Benares. Operation on the 21st July, 1831; stone weighed 526 grains; composed chiefly of triple Phosphate, with a Lithic

acid nucleus. The specimen was lost in the course of transmission to the Society. The patient was well on the 19th August.

Case 16*th.* Ruoshun Joolahur, æt. 14 years, residing at Uleepore near Benares. Operation on the 24th July, 1831; the stone weighed 250 grains, and is composed of $\frac{75}{100}$ Lithic acid, $\frac{25}{100}$ fusible Calculus. The patient was well on the 19th August. No. of specimen in the Society's collection, 51.

Case 17*th.* Thakoordigal Noonija, æt. 18 years, a native of Nundeesur near Benares. Operation on the 11th Sept. 1831; the stone weighed 326 grains, and is composed of Lithic acid, and Phosphates of Lime and Magnesia, with some Oxalate of Lime; the patient was well on the 30th Sept. 1831. The specimen is in the Society's collection, No. 50.

Case 18*th.* Goora Joolahur, æt. 19 years, a native of Sasseran. Operation on the 25th Oct. 1831; stone weighed 870 grains, composed of Lithic acid, and earthy Phosphate and Carbonate. This patient was under treatment and doing well when the report was drawn up. The stone in the Society's collection, is No. 49.

Benares, Nov. 3, 1831.

CASES

OF

URINARY CALCULI IN NATIVES OF INDIA.

By W. DARBY, Esq.

Presented, March 2nd, 1833.

The following cases of stone in the bladder in Natives of the Upper Provinces of India, came to Almorah, and claimed relief from their sufferings: and the lateral operation of Lithotomy was successfully performed with a common scalpel, grooved staff and forceps.

Case 1*st.* Jeuna, a respectable Zemindar of the village of Ghoomtalee, a fine stout muscular man, 43 years of age, had suffered symptoms of stone in the bladder for nine years. He requested advice in the latter end of September, 1832, and the operation was performed on the 7th October. The perinæum was deep, and the calculus large. In the act of extraction, the stone broke, but all its fragments were carefully removed, and were found to weigh one ounce and a quarter. The man bore the operation well, and had a quick recovery. The stone, composed of Oxalate of Lime, is No. 53. in the Society's collection.

Case 2nd. Nurr Sing, a healthy man, 27 years of age, from the village of Chouheesee, was afflicted with symptoms of Urinary Calculus for three years, and latterly his sufferings had been extremely severe. The operation was performed on the 18th October, 1832, and the stone extracted without any difficulty; it weighed 520 grains, and is composed of Oxalate of Lime and Lithic acid: it will be found numbered 48, in the Society's collection. The man was cured.

Case 3rd. Was a middle-aged Hindoo, who had long suffered from the disease. The operation was performed on the 24th Nov. 1832, and a stone extracted, which weighed 600 grs.: it is a fine specimen of alternating Calculus, being composed of Lithic Acid, Oxalate of Lime, and Phosphate. No. 47 in the Society's collection. The patient recovered in a short time.

Case 4th. A Hindoo, aged about 50 years, who was much reduced by long suffering from the most distressing symptoms of stone in the bladder; applied for medical aid in December, 1832, and brought seven small Calculi which he had voided per urethram at different times: their surfaces were rounded and even. The operation was performed on the 6th of January, 1833, and when the incision was made into the bladder the stone was found to be large and soft; it was also firmly adherent to the bladder, and was crushed into many pieces by the pressure of the forceps. The fragments were carefully removed, and the patient being relieved from all his distressing symptoms had a rapid recovery. The fragments of the large stone weighed nearly two and half ounces, and on analysis were found to consist of Lithic acid and Phosphate. The latter preparation, is No. 57 in the Society's Museum; the seven small Calculi are numbered 58 in the larger case.

Almorah, February 5, 1833.

CASES OF LITHOTOMY

ON

NATIVES OF INDIA.

By W. BELL, Esq.

Presented, 1st Sept. 1832.

Several natives residing in this part of India requiring relief from the most distressing symptoms of Urinary Calculus, in the bladder, having presented themselves to Mr. Darby, Surgeon of the 30 Regt. Native Infantry, and to myself, have afforded us both opportunities of operating several times; and there seems reason to consider *the stone* a common complaint in this province (Kemaon). Mr. Traill, the Commissioner tells me he is frequently applied to during his travels in the district, to afford relief to those suffering from this disease. The native surgeons sometimes cut for the stone much after the old method "on the gripe" as it was termed, but they will never undertake the operation unless an application has been first made to the civil power, stating, that in the event of death, the operator is not to be prosecuted by the relatives of the patient. A prosecution of this nature did actually take place

some years ago at Sireenuggur: very fortunately we have not as yet made ourselves amenable to an action at law of this sort.

Case 1*st*. A lad of about eight years of age, was brought to me from a neighbouring village, labouring under all the symptoms of Stone in a most aggravated form; together with prolapsus ani from the excessive irritation it produced. On introducing the sound I had no difficulty in striking the stone, which from the sensation it produced, I imagined was of a large size. To satisfy my own curiosity I at the same time introduced my finger up the rectum, to ascertain if I could also feel it through the coats of the intestine; but this I could not accomplish. After putting the boy under some preparatory treatment, owing to the foul state of his tongue and general irritability of his system: with the assistance of Surgeon Darby I performed the lateral operation on the 27th July, 1832, with a grooved staff and scalpel, not having in my possession either a gorget or beaked knife. Some delay took place from the want of a proper pair of forceps: however, nothing particular occurred, and no inflammation ensued; on the 3rd day the urine began to pass by the urethra, and on the 14th day from the operation, the boy had quite recovered, and was able to walk to his home.

The Calculus I beg to enclose, to be added to the other specimens in the Society's Museum. From its size (half an ounce all but four grains), and general appearance, no wonder the lad's sufferings were so severe. This stone consists of lithic acid, with a little Phosphate and Carbonate of Lime. No. 56 in collection. What renders this case somewhat more interesting than common, is, that the patient had been cut for the stone 5 years before, by a Native operator; from the brother's statement who was then present. He asserted that a similar stone to the present one was extracted; the nature of the instrument used I cannot learn, nor can I find out where the operator resides. The boy bears the mark from a cutting instrument on the opposite side of the Perinæum, to the one we generally prefer

(viz. the right). He has also a like scar over the region of the bladder on the right side above the Os Pubis, which was made at the time, but for what purpose I cannot imagine.

Case 2nd. A man above the age of puberty, residing near Poonal, applied to me on August 19th, suffering under symptoms of Calculus, which had annoyed him more or less for the last 8 or 9 years. On introducing a catheter I discovered a large stone, and found the bladder was not capable of holding more than an ounce or two of urine at a time. After putting the patient under a slight preliminary treatment, with Surgeon Darby's assistance, I performed the lateral operation: on withdrawing the staff and placing my fore-finger as a guide to the forceps, I found that the bladder was nearly filled with Calculi of different sizes: I seized one of the largest with the forceps, but the layers of which it was composed gave way at the time of extraction, and we were under the necessity of removing the remaining portions by repeated introduction of the forceps. On examining its nucleus, I do not think from its great size that the Calculus could have been removed had it not broke. The nucleus of a second stone was removed without any difficulty; it is of an oblong shape, small, with an even surface all round. The 3rd Calculus we were not so fortunate with: it was easily laid hold of; but either from its size or adhering to the coats of the bladder, it was found impossible to extract it. I then endeavoured to break it, but unfortunately in the attempt my forceps broke; in this dilemma no alternative remained but to leave the stone in the bladder for a future operation. From the collection of the pieces and the small nucleus which I beg to present to the Society's Museum, some idea may be formed how much this man's bladder was distended; the quantity preserved weighed nearly 3 ounces, besides a number of small particles which were lost; altogether, with what now remains I suppose not less than a quarter of a pound must have been in the bladder previous to the operation. The operation was protracted and severe, which the poor man bore most manfully. On removal from the table he was somewhat faint, and his extremities began to feel cold; but under the influence of a little

ammonia and other stimuli he completely rallied, and continued slowly to recover. On the 14th September, 25 days from the operation, the wound had nearly healed, and the urine came by the regular channel. As he expressed a wish to go to his home, this was granted. He promised he would again apply to me, when sufficiently strong to undergo another operation.

I cannot but deeply regret the necessity I was under of leaving this poor man to the pain of a second attempt, from the want of a proper set of Lithotomy Instruments: those I have lately made use of, were made up under my own directions by a Lohar mistree (an ordinary country blacksmith) of this place, and are of course very inferior to a European set. If the Medical Board would sanction a complete case being sent to the Senior Surgeon of each station, to be available to those under him, it would be conferring a great favor, and be the means, no doubt, of relieving many an object suffering from such a painful disorder. The Calculi extracted from this patient are chiefly composed of Lithic acid. No. in the Society's collection, 55.

Case 3rd. In addition to my former Lithotomy cases, I have the pleasure to send another packet, containing two stones which I extracted from a boy by name Kemier, residing at his village Bissunt. He had suffered from the complaint about 7 years, and was not quite so healthy in appearance as my first subject; but he bore the operation well, and the result was equally satisfactory. The largest stone is nearly an ounce; the smaller one, which was very brittle, gave way on extraction: the whole weighed 520 grains; composed of Lithic acid and fusible Calculus. No. in the Museum, 54.

I avail myself of this opportunity to state, that Bronchocele exists in this part of India to a most frightful extent. If the Society possess any means of furnishing me with a supply of Iodine, and the Hydriodite of Potash, I shall be most happy, and give it a fair trial. Cases I can never be in want of,

as I am constantly applied to for relief; and the little assistance I have been able to give or recommend has chiefly been a warm covering, to defend the glands of the neck from exposure to the air.

Hawulbaug, Feb. 4, 1833.

CASE

OF

LITHOTOMY ON A NATIVE,

IN WHICH THE STRAIGHT STAFF WAS USED.

By W. L. McGREGOR, M. D.

Presented, 8th Dec. 1832.

The subject of the following case, is a native of the Sikh tribe named Pop Singh, about twenty-four years of age, of full habit of body, and healthy appearance. On first presenting himself, he stated, that he had been induced to come to Loodianah from a distance of thirty miles, on account of an excruciating pain in the region of the bladder, extending along the perinæum, and of course of the urethra, as far as the glans: that from this complaint he had been suffering for the last twelve months; and the pain, so far from diminishing during that period, had been daily becoming more severe, so as to be now almost intolerable, and that he must soon sink under it, if no relief could be afforded him. The pain is greatly aggravated after voiding his urine, which he seldom does unless compelled by absolute neces-

sity. The catheter, on being introduced into the bladder, rubbed against a hard substance; and the grating sensation thereby produced, plainly indicated the presence of a stone. Since the administration of medicine could be of no avail, I told him, that the only effectual remedy in my power, was extraction; and that I was willing to perform the operation, provided he would remain in the Hospital until the necessary apparatus could be procured: to this, after a short consultation with his friends, several of whom had accompanied him, he readily assented; adding that sooner than endure a repetition of his sufferings, he would gladly submit to any privation and inconvenience. Having none of the instruments usually employed in Lithotomy, I lost no time in getting those of most easy formation made ready; and this I was enabled to do, through the kindness of the commanding officer, who allowed his native blacksmith to construct whatever instruments I might require. A straight staff, of the form recommended by Mr. Key, was soon finished, also a forceps; scalpels I already had, which, with a little rounding of the back near the point, were intended for the section of the prostate gland. With these instruments, and the able assistance of my friend J. Duncan, Esq. Surgeon, 14 N. I. I performed the lateral operation on the 13th instant. After the patient had been firmly secured on the table, his friends (no doubt a little alarmed at the preparations), requested permission to give him some spirituous liquor, which they had in a small bottle, and

of which the Sikhs make a free use: to this proposal I offered no objection; and after the man had drank a little, he said he was now ready for whatever steps might he deemed necessary to the removal of the stone. The catheter was first introduced, on account of some difficulty offered to the passage of the straight staff; the former being withdrawn, however, the latter readily entered the bladder, and its point was felt touching the stone. Keeping the staff with the handle a little depressed, and its point resting firmly against the stone, the external incision of the usual extent was made through the integuments, and continued through the fuscia, fat and muscles, until the knife reached the staff in the membranous portion of the urethra: having entered the groove, the handle of the staff was still further depressed, in order to prevent its point from slipping out of the bladder, as well as to raise the prostate, and thus diminish the risk of wounding the rectum. The groove of the staff which now pointed downwards, and the edge of the knife, were turned towards the left side, and the prostate divided, by pushing the knife slowly and steadily along the groove, until the want of resistance, and the flow of the urine, shewed that the bladder had been entered. The fore-finger of the left hand was introduced through the wound, the staff withdrawn, and the forceps passed along the finger into the bladder; the stone being felt, and with some difficulty grasped, and its size ascertained, I found upon trial, that the section of the prostate and neck of the bladder was

too small to admit of the easy exit of the stone; the opening was accordingly enlarged, and the staff now introduced through the wound in the perinæum: the stone was again laid hold of, and brought out in the direction of its longer axis; when extracted, it weighed an ounce and two drachms, was of firm consistence, and the surface in some parts studded with shining crystals, which appeared to have been recently deposited. The stone was hard and perfectly entire, its shape oval, slightly flattened; its greatest length $2\frac{3}{8}$ inches, and its girth or circumference four inches: it appeared light for its size; and is probably composed of lithic acid, with an admixture of the triple phosphate; the latter constituting the crystals, while the interstices are filled up by the acid and perhaps some animal matter, and thus forming the different layers of which the stone is made up. The man bore the operation remarkably well; the hæmorrhage was moderate, and returned in a slight degree after the patient had been placed on his bed. About an hour afterwards, he complained of nausea, and vomited the spirits which he had previously drank; this afforded him great relief. The urine passed though the wound for some days, but gradually returned to its natural channel, through which he now passes it without pain, the wound in the perinæum being nearly healed.

Since operating for the above case, I have learned that Calculus is by no means an uncommon complaint in this part of the country; and an intelligent

native assures me, that he knew of two people who had lately died of the disease, one of them a young boy, son of a friend of his own. The advantage of cutting on a straight, compared with a curved groove, gives a decided preference to the straight over the curved staff; and the knife or scalpel has been long recommended by anatomists and surgeons, as a safe and eligible instrument for the section of the prostate gland; since using them, I am glad to see their adoption recommended by Mr. Brett, after a sucessful trial of them in several cases of the lateral operation. This stone is No. 46 in the collection, and is composed of Lithic acid and some Oxalate of Ammonia.

Loodianah, 29th Nov. 1832.

CASE OF URINARY CALCULUS

IMPACTED IN THE URETHRA,

WHICH CAUSED SLOUGHING OF THE PREPUCE AND SCROTUM.

By W. MITCHELSON, Esq.

Presented, 7th July, 1833.

Inerjeet Suma, a Sepoy in the Nusseeree battalion, was admitted into hospital with the scrotum much distended generally; several gangrenous spots on its lower part, and great fulness and tenderness of the perinæum. He says the swelling only commenced nine days ago, although for the last 11 years he has experienced the greatest difficulty in passing urine, in consequence of a hard substance lodged in the urethra; this was first felt in the perinæum 11 years ago, since which time it has slowly, by the efforts of the bladder and assistance of his fingers, been brought to within an inch of the orifice of the urethra, where it has been fixed for the last three years. At first the bladder was emptied with much pain, the urine flowing guttatim; latterly, from having squeezed the parts frequently in his fingers, the difficulty became less. On examining the parts, I found the prepuce covering

the glans penis, and with an opening barely sufficient to admit the small end of a probe; the hardness he mentioned was easily felt where the urethra joins the glans, and evidently caused by a small Calculus; he was not aware of any increased difficulty in making water just before the swelling appeared, but first felt the uneasiness about the perinæum, after a long morning drill, nine days ago. The prepuce was divided with a scalpel, and the glans was uncovered; the stone was then easily taken out by enlarging the orifice of the urethra: about one half of the stone was lodged in the substance of the glans, and from its form (mulberry), it came away in small grains; the portion projecting into the urethra came away entire, and is forwarded with this memorandum. A catheter was introduced after this, and the bladder emptied without any difficulty. I then made an opening into the tumor in the perinæum, and discharged about $1\frac{1}{2}$ oz. of fœtid watery matter, without relieving in any way the tension of the scrotum. On scarifying the lower part of it with a lancet, a watery discharge came away; the catheter was withdrawn, and a large warm poultice put over the whole. As the case is not important enough to detail the daily appearances, it may be sufficient to say that on the 8th day the gangrene had occupied the whole of the scrotum and upper part of the perinæum, from the opening, in which a thin watery discharge continued. The dilute nitric acid lotion, and latterly warm turpentine dressings, were applied in conjunction with the poultices, and on

the 12th the entire scrotum had sloughed away, leaving the testicles red and granulating; suspended by the spermatic cords: the cavity in the perinæum had become filled with healthy granulations, and the discharge entirely disappeared about the 18th. The case went on very favourably, and on the 18th of May the parts were healed over the testicles, secured by a new covering of skin binding them up to the pubes; I have no doubt their weight, however, in a short time, will give it more the appearance of the original bag.

I may remark, that the man is 51 years of age, has long been married, and has a family of children, the last begotten 5 years ago, when in the midst of his troubles with a stone in the urethra, and the orifice in the prepuce almost closed.

Subathoo, 26*th May*, 1832.

CASE

OF

RENAL CALCULI IN A HINDOO.

By T. A. WISE, M. D.

Presented, 6th Oct. 1832.

The subject of the following case is a stout healthy Hindoo about 40 years of age, who holds an appointment in the Court at Hooghly. He has been accustomed to live full, and indulge freely in oleaginous, and other indigestible substances, and to drink impure water, which probably influenced an individual predisposition to the formation of Calculi in the urinary passages.

In December last, the first indication of the presence of a Calculus in the kidney manifested itself, by loss of appetite, nausea, uneasiness in the loins succeeded by acute pain in the region of the left kidney, with fever, retching and vomiting. The pain extended downwards and forwards, and he indicated its course by that of the ureter. This pain suddenly ceased, and the Calculus No. 1, was

voided with a quantity of high-coloured urine, with great relief to the sufferer.

The other two Calculi marked No. 2 and 3, were passed in March and July last, with the same distressing febrile paroxysms.

The formation of these Calculi appears to have taken place some time before they were discharged; by the deposit of the crystallized lithic sediment or gravel in the different infundibula of the kidney in which they had been formed. Had this deposit in the urine been allowed to continue, they would have attained such a size as to render their passage through the ureters impossible.

Since the man has been restricted to a suitable diet and regimen, with occasional medicines to check the disposition of the urine to further deposits, he has not had any return of the paroxysms, and feels quite well.

Hooghly, 20*th Sept.* 1832.

MEMORANDUM OF A CASE

IN WHICH

NUMEROUS RENAL CALCULI

AND

EXTENSIVE VISCERAL DISEASE WERE OBSERVED ON DISSECTION.

By A. K. LINDESAY, Esq.

Presented, 2nd June, 1332.

Sergeant Aaron Beelly, pensioner, aged about 60, died at Chunar, April 25th, 1832.

This man was invalided in 1797, in consequence of having lost his left arm by the explosion of a shell, the wind of which he supposed injured his left side ! ! He had been in India altogether 40 years: in his younger days he had lived freely, but for many years has been a remarkably steady and respectable man.

For upwards of 20 years he has been subject to chronic hepatitis, and (supposed) enlarged spleen, angina pectoris, dyspepsia in a variety of shapes, dysuria,

occasionally passing gravel, and two years ago he had a fit which left him subject to paralysis tremens ; (the tremors of his whole body were so constant, as to interfere materially with a satisfactory examination of his chest or pulse.) So many ailments for so many years, necessarily make his case run through the hospital records as far back as insects and decay have left them a legible existence.

Within the last few months he has been breaking up, having been frequently in Hospital with dyspnœa, palpitation, increase of swelling and pain of left hypochondrium, scanty urine and swelled legs ; also occasionally having much trouble from his gravelly complaints. He died worn out, and the following sketch of appearances on dissection will, I trust, render of some interest the accompanying masses of calculous matter.

Body well covered with fat, the thorax much reduced in size by the pressing upwards of the abdominal tumor, and a very much enlarged heart, which was not diseased in structure, but excessively enlarged in all its dimensions, preserving pretty exactly its natural proportions : lungs lodged in the back of the thorax, perfectly healthy. No unusual quantity of serum either in pericardium or thorax. Liver somewhat enlarged and hard, of a bluish grey color mottled with white, gall bladder natural. There were eight or ten ounces of serum in abdomen. In the left hypochondrie and lumbar regions, there was felt a

large mass with the omentum and intestines spread over it, and joined to it and themselves by numerous bands of adhesion; the spleen was found on the upper part, pressed up under the ribs, *smaller* than natural, hard, and having many patches of cartilage on its surface; in detaching this organ from the subjacent confused mass, a smart jet of serum followed a stroke of the scalpel, which on a little farther research was found to proceed from an immensely enlarged kidney: the tumor was fully the size of the head of an adult, but part of it was flacid on the escape of the fluid above noted; on laying it open the distending fluid all escaped, and with it quantities of gravel: the cyst was simply a dilatation of the kidney, the substance being very thin, while the lining membrane was much thickened: the size was also increased by a few globular transparent cysts* on the suface of the kidney, containing a melicerous matter; throughout the greatly distended ramifications of the pelvis of the kidney, were quantities of gravel lying loose, and bearing marks of attrition, and a large fungus-shaped Calculus was embedded in a cartilaginous mass, the extremities of the processes protruding into the infundibula. The right kidney was large and vascular; in it was found an irregularly-shaped stone, with a few rounded pieces of gravel. The bladder contained several ounces of urine, but not a particle of calculous matter. Darkness and other circumstances rendered it impossible

* Three or four of these hydatids were as large as small oranges, the rest were smaller.

farther to trace the extent of such complicated disease, though every step of deeper research would have been highly interesting.

The Calculous matter collected and dry, weighed (in all) $13\frac{1}{2}$ drachms: it is sent herewith. The largest stone was that embedded in the left kidney, the paler next in size was from the pelvis of the right kidney: about nine-tenths of the gravel, and a white, scaly, crumbling Calculus were in the left; the remaining portion in the right kidney. The specimen is marked 61 in the Society's collection, and is a beautiful example of the hemp-seed Calculus.

Chunar, *April* 18*th*, 1832.

APPENDIX.

No. 1.

Brief notice of a Mild Epidemic Fever which prevailed at Indore and other parts of India, in April, 1832. *By S. Ludlow, Esq. Superintending Surgeon.*

[Communicated by the Medical Board.]

The disease commenced with pyrexia, accompanied by pain and sense of constriction across the chest, which was followed by slight superficial inflammation of the throat. As the febrile symptoms subsided, a painful tenderness of the trachæa, attended by cough and hoarseness, supervened.

It is mentioned, that at Indore scarcely an inhabitant of the city escaped the disease. At Mhow it first attacked the natives in the Sudder Bazar in considerable numbers, and some deaths are reported to have happened. It afterwards spread amongst the officers and servants. At a time when 70 or 80 men of the 65th Regt. were in hospital in consequence of the Epidemic, not more than a case or two occurred in the 7th Cavalry, although both corps had lately arrived at the station.

The treatment consisted of purgatives and antimonials, and in those cases where the severity of the symptoms demanded it, topical or general bleeding was had recourse to. A low diet was also strictly enjoined.

The disease disappeared about the end of the month, and although it usually left the patients in a state of great debility, no other bad effects were stated to have arisen from it, nor were there any fatal terminations, except a few patients who were reported to

have died in the Bazar. The Epidemic was ascribed to the state of the atmosphere. Immediately before it appeared the weather had been sultry and calm : the atmosphere hazy in the day, and at night chilly breezes from the N. E. had been frequent. Mr. Ludlow observes, that the previous cold season had been remarkable on account of the unusual quantity of rain which fell throughout the northern and western provinces of Bengal. At that time salivation was frequently observed to arise after the use of very small quantities of mercury : and cholera of a severe and fatal kind appeared in the rainy season among the European Artillery, but was evidently often the consequence of drunkenness. Vaccination was singularly successful at that part of the country this year : whereas in 1831 (a remarkably dry season), of 50 or 60 vaccinations only one child had the true vaccine pustule ; but many had a spurious pustule, sometimes accompanied by slight eruptions on other parts of the body.

No. 2.

On the Epidemic Fever which prevailed in the Merut Division. By Geo. Playfair, *Esq. Superintending Surgeon.*

A Report to the Medical Board contained a brief notice of an Epidemic which appeared at Merut about the same time, (7th of April,) and which, in character and intensity, very much resembled that which is above stated to have occurred in Mr. Ludlow's division. In the course of 10 days it affected upwards of 200 men of H. M. 26th foot. The same Epidemic had appeared at Bareilly and in the other parts of Mr. Playfair's division, early in April ; but in no one instance, either here or at Merut, did it prove fatal.

No. 3.

Abstract of a communication from J. C. Boswell, *Esq. of Penang, concerning a very destructive Fever which prevailed in that Island during the months of June, July, and August,* 1832.

Mr. B. observes, that in many cases, at least, the disease differed most materially in its mode of attack from the inflammatory con-

gestive fever, which he had previously been in the habit of witnessing, in as much that instead of the quick, strong pulse, seldom less than 120, great heat of surface, and little or no previous rigor, by which the early stage of this form of fever in Penang is usually marked; that the pulse never exceeded 96 at the onset, and was full but oppressed, and sometimes it was small; frequent chills were also observed, and in some instances the attack was ushered in by a distinct rigor.

There was also severe head-ache, which was usually confined to the forehead, and extended across the eyes. Pressure on the eyeballs gave pain, and in one case it was remarked that the left iris was nearly insensible, while the right was sluggish. The stomach in most cases was irritable; the abdomen was more or less tympanitic, and when pressed the patient complained of pain. In some cases the disease attacked persons previously in good health, coming on suddenly after fatigue or exposure to atmospheric vicissitudes; in other patients an insidious fever crept on slowly for several days, and then formidable cerebral symptoms were suddenly developed. In the majority of cases, more or less distinct exacerbations were abruptly followed by a stage of collapse, which was apt to terminate fatally.

The treatment consisted principally of active, general, and sometimes local, depletion, at the commencement of the attack. It was observed that the blood was to all appearance healthy, and after its abstraction the pulse uniformly changed in character, becoming fuller, and increased in frequency. This was followed by a free use of common laxatives, and enemata; Mr. Boswel seems also to have placed great reliance on the nitrate of silver blisters, which were applied to the shaved scalp in every instance: "In congestions of the brain in particular," says Mr. B. "I consider the degree of pain caused by the application of the Arg. Nit. as the best index of returning health; and the many cases which I have transmitted, at different times to the Medical Board, may, I think, serve to prove it so."

Mr. Boswell admits the propriety of large doses of calomel, in cases of inflammatory congestive fever, where arterial action is so

strongly indicated ; but in the course of his observations of the form of fever now under notice, his experience induced him to discontinue the use of frequent and large mercurial purgatives.

No. 4.

Disease of the Heart attended by Pyrexia, the symptoms of local disease indistinct, the case terminating fatally by rupture of the heart. By H. M. Galt, Esq.

At the meeting of the Society held on the 3rd Sept. 1831, a letter from Mr. Galt, Assistant Surgeon, Bengal Service, was read, containing a case of fever which terminated fatally by rupture of the heart: the disease occurred in a Sipahee, who had been ill about a month, but had avoided going into hospital, in hopes of recovering by the use of his domestic remedies. This man's illness continuing, he was compelled to resort to the hospital on a Monday, and had then the ordinary symptoms of fever, but not in a very severe degree: the pulse was 90, regular, and neither very full nor hard ; tongue white ; and some morbid heat of skin was present. There was evident induration of the liver, but no pain on pressure. The respiration and action of the heart appeared regular and unembarrassed. The patient was purged with calomel, colocynth, and castor oil ; leeches were applied to the side, and antimonials administered ; whereby the symptoms of pyrexia were mitigated, and he felt better ; but his pulse continued rather quick. He stated himself to be much better on Tuesday evening, and on Wednesday morning early, he died suddenly. On dissection, adhesions of the pleuræ were observed in both sides of the chest ; the pericardium was greatly distended, containing about a pint of blood, part of which was fluid, and part coagulated. There was much morbid vascularity of the pericardium ; the structure of the heart itself, had to a considerable extent, undergone a change to an adipose appearance ; and about the extent of half an inch of the left ventricle at the apex of the heart, was changed to a white substance, easily divided by the knife ; and at this part was a perforation large enough to admit the

point of the finger, leading into the left ventricle; a small membranous sac, about the size of a grape, was found detached from any part, and floating in the blood in the pericardium; it corresponded in size with the opening into the left ventricle, and was considered by those who saw it, as resembling a part of the very apex of the diseased structure of the heart. The liver and spleen were both enlarged, and there was a great quantity of serous fluid in the abdomen.

No. 5.

Blood-letting in the cold stage of Intermittent Fevers.

A communication from J. J. Boswell, Esq. dated Ghazeepoor, 9th January, 1832, contains a brief statement of the great benefit with which he had employed V. S. in the cold stage of intermittent fevers, when on duty with the Artillery. He states that blood-letting at the commencement of the rigor had been attended with almost invariable success. In only one case he was obliged to have recourse to the use of the lancet a second time. Mild purgatives were also employed in those cases.

No. 6.

Prevalence of Measles at Calcutta, in 1832, *by* Fred. Corbyn, *Esq.*

Rubeola was very prevalent at Calcutta and the vicinity in March, April, and May, 1832; and numerous cases of varioloid disease, as well as some fatal cases of confluent small-pox, occurred at the same time. While these diseases were rife in this neighbourhood, other complaints appeared to be for the time in some measure superseded. The cases of Measles which came under the author's observation, were in general severe; the pyrexia ardent, and the cough very distressing; but the disease does not appear to have been very fatal.

No. 7.

Occlusion of the Ductus Communis Cholidochus. By J. McCleland, Esq.

Cordell, an European pensioner, at Chunar, Æt. 31; eleven years resident in India, suffered for three months from symptoms of chronic dysentery, attended with pain in the region of the liver; for which he was repeatedly salivated, but without benefit; he gradually sunk under the dysenteric symptoms. On post-mortem examination, the mucous membrane of the great intestines was found in a state of ulceration; the liver was of a dark color, but not otherwise diseased; the gall-bladder contained a small quantity of dark viscid bile: the Ductus Communis Cholidochus was compressed by an enlarged gland, seated in the Capsule of Glisson, and its canal was obliterated. The author refers to the cases of occlusion of the biliary ducts, recorded by Mr. Twining, in the 5th vol. of this Society's Transactions, in proof of the frequency of obliteration of these ducts; and also mentions Portal's case of obliteration of the biliary ducts as well as the gall-bladder, related in the treatise *Sur la nature et le traitement des maladies du foi;* Dr. Farre's case in his *Morb. Anat. of the Liver;* Dr. Todd's case in the 1st vol. Dublin Hospital Reports, and Dr. Percival's case in the 2nd vol. of the same work. Mr. McCleland observes, that in a pathological point of view the inference that occlusion of the biliary ducts is not of unfrequent occurrence in India, is of high practical importance and worthy of careful investigation by the Society. He further observes, that the observations of Majendie and Brodie are singularly at variance, respecting the uses of the bile and its importance in the process of digestion. Vide Journal of Science, No. xviii. and Medical and Physical Journal, vol. 56, p. 340.

No. 8.

Case of Incised Wound of the Throat. By Dr. A. Gilmore.

The wound, which was inflicted with a sword, occupied the interspace between the Thyroid Cartilage and Os Hyoides; it penetrated to the Pharynx, but no important blood-vessel was divided

the incision gaped frightfully, and when the muscles of the part were thrown into convulsive action, several fingers might have been introduced into the gullet at once. Nevertheless, when the edges of the wound were in apposition, and the cut was covered with a bit of lint, the patient could utter articulate sounds.

As the man was deprived of the power of deglutition, he subsisted on fluids which were introduced into the stomach, by means of the flexible tube, during the whole of the healing process. Under this plan, the case terminated favourably; the wound healing by granulations, and at the date of his dismissal from hospital he had the full powers of deglutition, and could also articulate distinctly, though a small fistulous orifice still remained in the throat.

No. 9.

Medical Report from Tirhoot, for the years 1830 *and* 1831. *By Dr. K. McKinnon.*

The author states that in the year 1830, Remittent Fevers, Variola, and Cholera appeared as usual; but Hospital Gangrene prevailed in a remarkable degree during the months of October and November. At that time, the weather was intensely hot and oppressive, and there was a large pool of stagnant water within a few yards of the Jail, which had in part dried, and was in progress of evaporation, and may have tended to aggravate, if not to produce the last-named disease.

There were a dozen cases of slight ulcer in Hospital, which assumed the characters of Hospital Gangrene, and spread with dreadful rapidity. In general, there was little constitutional disorder, and the local inflammation was not extensive; but the fœtor was extreme, and peculiar. The remedy which appeared to the author most beneficial was the application of undiluted Nitric Acid; which in almost every case was useful in arresting the progress of sloughing, and altering the character of the sores. The Chloride of Lime had some effect in destroying the fœtor. The ulcers which came under treatment during several months, after the Hospital

Gangrene had ceased, were of an obstinate character, though void of sloughing; and Dr. McKinnon thought it necessary to remove them to a separate apartment, and to have early recourse to fumigation.

The year 1831 was remarkable for a degree of sickness and mortality beyond what had been observed in Tirhoot for many years. There were many deaths from Cholera in June, July, and August; and Remittent Fevers prevailed and proved very fatal during the months of September, October, November, and December. The most fatal forms of Cholera were observed in unhealthy and low situations; and it was very destructive after several heavy falls of rain about the middle of June. Some villages are stated to have been literally depopulated. It was observed, that the quantity of stagnant water was greater than usual in the district during this season. Many persons were attacked with Cholera at Poosah, in June, and the disease was observed subsequently all over the district; but it did not move by regular stages. In the family of the overseer of the lines of Poosah, only one person out of seven or eight escaped an attack of the disease: in the Stud-lines, it did not affect the syces in one particular stable, but men had the disease at the same time in various and remote stables, without any direct order of succession. The disease did not appear in regular succession, or attack the nearest villages to those where it first prevailed; frequently several contiguous villages escaped, while Cholera appeared in those more remote. Though several prisoners in the Jail were attacked with Cholera, and died of the disease, it did not spread generally among the prisoners. The malady exhibited its usual characters, but in an extreme degree of intensity; often proving very rapidly fatal. The author observes, that the first manifest disorder of function in Cholera occurs in the stomach and intestines; and they are affected not by increased action alone, but specifically, so as to throw out a secretion of a peculiar character; and he considers this effect the result of some specific cause. In the treatment, the lancet was found useful, where there was a deranged, but not collapsed circulation. Laudanum and Calomel are acknowledged frequently useful, though occasionally case after case occurs when these remedies are unsuccessful.

No. 10.

Abstract of a letter from R. N. Burnard, Esq. giving an account of a case of Compound Fracture of the Thigh, in which amputation at the hip-joint was performed.

The subject of this case was a boy, about 12 years of age, who, by a fall from a tree, had sustained a severe compound fracture of the right thigh, about $1\frac{1}{2}$ or two inches below the trochanters. The accident had happened twenty days previous to his admission into the Hospital, on the 25th January, 1830, when Mr. Burnard saw him for the first time. The whole of the leg at this time was in a state of mortification, the gastrocnemii muscles detached from their superior attachment, and the back of the knee-joint exposed; the fleshy part of the thigh below the fracture was in the same state of mortification, with the exception of a small portion on the inside, which alone connected the dead mass to the living. Above the fracture there was a small extension of mortification, but there appeared no disposition for it to spread higher, and nearly the whole of the parts affected could be included in the incisions for forming the flaps. It was immediately determined to amputate the limb at the hip-joint, which was accomplished as follows:—Mr. Burnard having no assistants excepting his native Doctors, commenced by cutting down on the artery immediately where it emerges, from beneath Poupart's Ligament. Having secured this by a single ligature, the knife with one stroke was directed through the connecting part in the inside, by which the operator got rid of the embarrassment of the limb, and then grasping the upper portion of the bone, abducted it as strongly as he could with one hand, while with the other, a catline was carried along it into the joint and round the head of the bone. The dislocation was easily effected, and the attachment of the muscle severed by carrying the knife round close to the bone; and after its removal two flaps were formed by cutting outwards, and inwards from the original incision made to secure the artery, and as far as possible including all the parts affected with sphacelus or threatened with it. Four small arterial branches required ligatures, but the whole hæmorrhage did not exceed three or four ounces, and the flaps were

brought together by three sutures, adhesive straps, compress and roller being afterwards applied. The operation and dressing occupied about 20 minutes; the patient bore it with great fortitude, and when returned to his bed appeared but little exhausted. On the evening of the 26th, symptoms of Tetanus came on, and pursued the usual course to the destruction of the patient; on the morning of the 28th he expired.

No. 11.

Two cases of severe wounds by Arrows, which recovered without any serious consequences. By Dr. H. H. Goodeve.

Case 1.—A Native Trooper, aged 30, of the 3rd Regt. Lt. Cavalry, was wounded by an arrow in an encounter with the Coles on the 22nd March, 1832. The weapon entered between the 5th and 6th ribs, on the right side, and taking a direction forwards and somewhat downwards, came out on the left side of the ensiform cartilage, the distance between the two wounds being about nine inches. From the relative position of the wounds, it appeared that the arrow must have penetrated the lower part of the right lung, passed through the diaphragm, and possibly wounded the left lobe of the liver. The arrow remained in the man's body completely transfixing his chest, and it could only be extracted by cutting off the feather end, and drawing the shaft through by the head which required some force. There was no hæmorrhage from the wounds, and the man, immediately after the receipt of the injury, rode into camp, a distance of two miles.

Case 2.—Occurred in a stout healthy native, about 40 years of age, in the same Regiment. In this instance the arrow penetrated his chest from behind, entering just below the right scapula, to the depth of four inches; it was easily extracted.

In both cases the wounds healed in the most favourable manner, and in the course of a short time, both patients were enabled to resume their active duties as soldiers.

No. 12.

Efficacy of Madar (the powdered Bark of the root of the Asclepias Gigantea), in extensive and obstinate ulcers in native patients.

A letter from J. L. Geddes, Esq. Assistant Surgeon, Madras Service; was read at the Society's meeting on the 4th Feb. 1832, containing the statement of a case in which the Madar had proved remarkably successful in the cure of an obstinate ulcer. The patient was a Sipahee, of an Infantry Corps, who appeared to be of a scrophulous diathesis. The disease had existed for a year, and the patient had been at Masulipatam six months, to try the effects of change of air, before he came under Mr. Geddes' care. All former treatment had failed. The ulcer was of an unhealthy appearance: situated on the upper and outer part of the left hip, extending from the trochanter major, over the situation of the gluteus maximus muscle, in a circular form, being in circumference upwards of 16 inches. The Madar was administered in pills, in the dose of four grains, three times a day. By the time that a drachm and a half of the medicine had been taken, the sore assumed a healthy aspect, and began to cicatrize. After a few days, there appeared some disposition at the upper part (where cicatrization had taken place) to ulcerate again. The Madar was continued until another drachm was taken, and the sore was completely cured. The medicine did not appear to produce any effect on the constitution, except causing the sore to heal. No other remedy, either external or internal, was used at the same time with the Madar; except a little simple ointment, which was spread over the surface, to prevent abrasions of the newly formed skin; and a purgative was occasionally administered; so that the efficacy of the remedy was unquestionable.

A letter from Dr. H. Mackenzie was read at the Society's meeting, on the 3rd Dec. 1831, relating the case of a native boy, of Sandoway, aged 13 years, who had been ill about 12 months with inveterate ulcers. The bones of the left fore-arm were bare and in a state of caries; there were numerous ulcers affording a very profuse discharge, and sinuses about the fore-arm and elbow; the patient was miserably reduced, and unable to stand; he had tried all the

ordinary resources of the district without benefit. The Madar powder was given twice daily, at first in doses of two grains, and afterwards gradually increased to five grains, twice a day; in which quantity it produced uneasiness and a disturbed state of the bowels; therefore the dose was reduced to three grains. The beneficial effects of this medicine were very evident in a few days: at the end of a week the boy's health was decidedly improved, and the profuse discharges from the ulcers had decreased; the decayed portions of bone were then extracted. At the end of five weeks from the time he began to take the Madar, all the sores had healed, and the boy was able to walk about. Dr. Mackenzie ascribes the early improvement of this boy's health, and his ultimate recovery, to the "restorative and invigorating properties of small doses of Madar; which remedy was left to produce its individual effects, without the exhibition of any other medicine, capable of modifying them in any degree."

No. 13.

Native Prescription for Ring-worm.

A letter from H. Guthrie, Esq. was presented the Society on the 4th February, 1832, with a native prescription for Ring-worm, which he had found on trial to be so useful in the cure of that species of Psoriasis usually called Ring-worm, both in Europeans and in Natives, that he desired to make the remedy known to the Society: the prescription is as follows:

The native names of the ingredients are annexed; as they are procurable in the bazars:

Quicksilver, one drachm—*Para.*

Sublimed Sulphur, half an ounce—*Gunduck.*

Juice of the leaves of the Toolsee plant (Ocimum Sanctum), two ounces—*Toolsee ka rus.*

These are to be carefully mixed; and added to powder of white Rosin, half an ounce—*D'hoona.*

Borax, one drachm—*Sohaga.*

Goat's Milk, two drachms.

The whole of which are to be mixed together, and formed into masses, the size of a musket ball. When required for use, a part

of one of these balls is made into a thin fluid paste with vinegar, and rubbed over the whole of the Ring-worm, three times a day, where it is allowed to dry; the part affected with the eruption, is not to be washed until the disease is cured. In severe cases attended with much irritation, the ordinary constitutional treatment may be requisite. This prescription is said to produce much less pain than the preparations of corrosive sublimate.

No. 14.

Cajeputi Oil in Cholera.

At the meeting of the Society held on the 5th May, 1832, a communication from Sir M. Tierny, was presented relative to the efficacy of Cajeputi Oil in Cholera; 50 drops are recommended to be administered in half a wine-glass of tepid water, and repeated every half hour, until 250 or 300 drops have been taken. Sir M. Tierny states this remedy to have been used successfully in the severest cases of Cholera; and that two or three doses, if given early, are usually sufficient to arrest the disease. The statements of the effects of Cajeputi Oil, in cases of Cholera occurring in Calcutta, do not correspond with the good effects which by the above account appear to have followed its use in England; that medicine having proved entirely inert when administered under circumstances which authorised expectation of the patient's recovery by the use of ordinary remedies: as much as six drachms by measure having been given to one patient in the course of five hours without the least effect. By a report published at Madras, it appears that Cajeputi Oil has been recently tried in H. M. 54th Regt. at Trichinopoly, during a severe epidemic visitation of Cholera; the effects of that remedy are stated to be very temporary, and by no means so beneficial as Mr, Hamilton, the Surgeon of the Regiment, had been led to expect.

No. 15.

On a preparation of Opium, by J. C. Boswell, Esq. Assistant Surgeon, Penang, 21st January, 1832.

[Presented by the Medical Board.]

I have been using for a considerable time past, in the Hospitals under my charge, a preparation of Opium, as a substitute for the

Liq. Opii Sedit. and Tinct. Opii, which I now beg leave to bring to notice, as I feel desirous to obtain the opinion of others relative to its virtues. The preparation I am now using, was made soon after I was put in charge of the Medical Stores.

Having occasion to make a quantity of the Tincture, I felt at a loss what to do with the residue after the Tinct. had been strained; when on reference to Paris' Pharmacologia, (see Note, Art. Opium,) it is stated, that Mr. Haden had macerated the dregs in a solution of Tart. Acid. and had found the product, as strong, and superior to the Tincture, in as much as it was devoid of either stimulating or binding qualities. After the trials I have made, I think, I can almost confirm that statement.

My solution was made, by adding about 2-3rds the quantity of water, which I had previously obtained of Tincture, with what I deemed sufficient of Tart. Acid. the solution was frequently shaken, and left for a month, then filtered. The dose I usually give is, from gtts. 50, to ʒj.

I am not aware what use is commonly made of the dregs in the other stores belonging to the Company, or whether any Tincture is made or not; but I have thought it right to communicate the above particulars, as if not otherwise employed, it is evident such an application as I have mentioned, if my observation is correct, may prove a saving in the proportion of at least one-half of all the Tinct. Opii consumed. A Phial of this Liq. Opii Sedit. used by me, is sent herewith.

No. 16.

On the Tartaric Solution of Opium used at the General Hospital, Calcutta. By W. Twining, Esq.

I have used the Opiate Solution sent from Penang, by Mr. Boswell; the quantity would not allow of any to be spared for chemical analysis, so as to ascertain the relative proportion, and exact nature of the solid matter in this medicine. It would be desirable to ascertain from Mr. B. whether the dregs left after the preparation of Laudanum, were used in making this medicine, in a

wet or dry state ;—also, what were the exact proportions of Tartaric Acid and water employed.

The whole of the solution was administered to sick and convalescents in the General Hospital, and it appears to possess considerable efficacy: its Anodyne and Soporific properties do not seem equivalent to half the strength of Vin. Opii ; but its action is peculiar, and if the present trials will enable me to judge correctly, I should state that it is a less exciting Opiate than Laudanum, when administered to patients in an irritable condition, and suffering from a slight degree of pyrexia; it is less liable to affect the head, or to produce constipation of the bowels, and is seldom or never followed by disorder of the stomach or impaired digestion, and it has a greater tendency to produce perspiration, than either Laudanum, or Vin. Opii. Patients who had been in the habit of taking large quantities of Laudanum, were unwilling to acknowledge that the Opiate Solution, now alluded to, had any evident effect either in the dose of one or two drachms.

Since the above report was drawn up, I have obtained 21 pints of Anodyne Solution prepared by dissolving 3xxi. of Tartaric Acid in 21 pints of distilled water, which was carefully mixed with the dregs left after making 63 pints of Laudanum, according to the formulæ of the London Pharmacopia. Jeremie's opium was used in making the Laudanum, and after it was filtered, the whole of the dregs were left on the filtre for 14 days; being then in the state of a tough paste, and about as firm as an ordinary mass for making pills, the above solution of Tartaric Acid was mixed with the mass, and the fluid stirred daily for 14 days, and then strained. The relative proportion of water is only half as much as Mr. Boswell used. The medicine prepared in this way is about as high-colored as equal parts of Claret and water: it is transparent, and a mouldy coat forms on the top of the fluid in each bottle in the course of ten days.

I have used the whole 21 pints of this solution in cases of severe pains of the bones and joints, affecting men who were emaciated and had broken constitutions from long residence in India, and from the frequent use of Mercury. These patients were the military invalids who arrived this season from the Upper Provinces, in the course of

transmission to Europe. The medicine was of the greatest benefit to patients of this class, who earnestly requested its repetition after having once experienced its effects. It was usually followed by a warm perspiration extending over the whole body and extremities; and the patients procured more refreshing sleep than after any other Opiate. I believe its exhibition never caused head-ache, and it seldom or never produced constipation of the bowels: in upwards of 40 patients who took this medicine, only one complained of constipation. In one case of most excruciating pains arising from irritable ulcers of long duration, the patient procured comfortable sleep, and was entirely relieved of his pains by doses of ʒiv. of this solution given every night at bed time. This patient is a Greek, who had formerly used large quantities of Opium. Another patient with irritable ulcers and severe pains in his limbs always slept well after taking doses of ʒiii. every night. No other patient required a larger dose than ʒii. I have administered this preparation of Opium, with great benefit, in the dose of ʒss. twice a day, combined with ten minims of Fowler's Solution of Arsenic, in some cases of irritable ulcers; and in irritable eruptions of great obstinacy and long continuance; in which many other remedies had previously produced no evident benefit.

No. 17.

On the Pendulous Tumor of the external Ear. By Dr. A. Campbell.

At the meeting on the 2nd March, 1833, a letter from Dr. Campbell was read, containing an account of the Pendulous Tumor of the external Ear, which is a very frequent disease among the natives of the valley of Nípal; and often observed to occur in the same individuals who are affected with goitre. Two tumors were sent by Dr. Campbell to the Society's Museum; they had grown from the helices of the ears of a woman, and drew down and doubled the ear over the external meatus auditorius, so as greatly to obstruct hearing. The surfaces of the tumors were uneven, and their feel fleshy, but firm; their internal structure is described as resembling that of mammary sarcoma. They were removed by

simple incision with a scalpel, and weighed together 24 ounces. The wounds soon healed, and the ears resumed their natural position. The patient from whom these tumors were taken, is affected with a large bronchocele; her eldest daughter, aged nine years, has a tumor, the size of a walnut, attached to each external ear, and another daughter, aged six years, has a goitre of three years growth, which is as large as an orange. In the same communication the author states, that bronchocele very often occurs in animals in Nipal, lambs and kids being often born with remarkable morbid development of the thyroid gland; some preparations of these diseases were also sent, as well as a steatomatous tumor, the size of a small orange, which was removed from the sheath of the penis of a dog; this animal was taken to Nipal from the plains of Bengal, in March, 1832, and in July, the disease was observed and removed.

No. 18.

Elastic Midwifery Forceps.

Dr. J. N. Casanova presented to the Society, an elastic midwifery forceps and a cephalo-extractor: these instruments are made of thin pieces of whale-bone, and are proposed as substitutes for the forceps and crochet. The forcep is a polished piece of whalebone, above three feet long, three-tenths of an inch broad, and less than one-tenth of an inch thick; having a large silver ring at each end. This instrument is intended to bring down the head when it is locked in the pelvis: in using it, the whalebone is doubled at the middle, so that both rings are grasped in one hand; the doubled part of the instrument is then carried up the vagina, and placed across the child's chin; a sliding band of silk (three inches in length, the ends of which are attached to the whalebone), is to be pushed up, so as to rest across the child's cheeks, and thus prevent the throat being forcibly compressed in the extraction.

The cephalo-extractor is to be used in cases where the child's body has been removed, but the separated head is left in the uterus. This instrument is composed of two pieces of whalebone, each precisely similar to the forcep, but without handles. These two pieces are

firmly connected at the centre by a rivett, but moveable, so that the instrument can be introduced into the uterus when both the pieces of whalebone are parallel and in contact throughout their whole length. When the instrument is thus introduced, so as to pass beyond the most remote part of the child's head, the two ends of one piece, are moved sidewise from the two ends of the other piece of whalebone, until the central parts of the two pieces (where rivetted) form a cross: the four ends of the instrument are then passed through holes in a silver plate less than the size of a shilling; and by sliding this plate upwards, the instrument is firmly fixed, and the head included in the double loop; after which, any justifiable degree of force can be used in extraction, with facility to the operator and perfect safety to the patient. Dr. Casanova says that an instrument somewhat similar has been proposed by an obstetric practitioner of Barcelona. The author states that the advantages of these instruments depend on their pliability, whereby no injury need be inflicted on the mother or child, while they are sufficiently strong for every purpose, and may be used without exciting the apprehension of the patient.

No. 19.

Description of a Double Fœtus. By J. N. Casanova, M. D.

Dr. Casanova describes a lusus naturæ borne at Laguna, about 30 miles from Manilla; the parents were youthful natives of that country, (Indios Tagalos,) and this their first offspring. Dr. C. only saw the subject now described 20 hours after its death. The persons present during the labor represented it to have been a footling case, and to have died in 30 minutes after birth. This lusus naturæ consisted of one pelvis and two lower extremities, of the usual conformation to the first lumbar vertebra; from whence upwards the subject was double, the last dorsal vertebræ of the two spines, uniting at the top of the first lumbar vertebra, as shewn by a delineation of the skeleton, which was presented with the paper.

A Native Physician of the Phillippine Islands had taken out the viscera before Dr. C. arrived, consequently his description of the

great vessels was not so complete as he could have wished. The account of other parts is given in the most minute manner; it appears, that the viscera of each thorax were complete, as in an ordinary fœtus; one stomach at its upper part received the æsophagus from each body, and a large vaulted arch of one diaphragm separated the cavities of the two chests from the abdomen common to both. The 12th, 11th, 10th, and 9th false ribs on the contiguous sides of the two chests were united, and their natural curvature altered.

No. 20.

On the Variety in the Effects of different Samples of Croton Oil. By W. Twining, Esq.

The singular efficacy of the Croton Tiglium (the Jamalgota of the Hindi language) has been sufficiently shown by the excellent Essays of Mr. Wilson and the late Dr. J. Adam, which are to be found in the 1st volume of this Society's Transactions. Those authors insist on our selecting young and sound Croton seeds for Medical use; but they have not stated that there is considerable difference in the purgative properties of different specimens of the oil. Two samples of Croton oil were sent to me for examination and trial. No. 1 was of a dusky yellowish color, and appeared rather thicker than No. 2, which was of a pale straw-color. They were both represented to be genuine, unadulterated oil of the Croton seeds, expressed without heat. The following trials were made on surgical cases and convalescents, or invalided men who were suffering from little or no disease at the time, and only requiring a dose of some purgative medicine. In most of the cases only one dose of each sort of oil was given, and then leaving an interval of 2 or 3 days, the same patient took a dose of No. 2, the pale-coloured oil. For the purpose of more readily contrasting the effects of the two sorts of medicine, the results of my trials on 17 patients are placed in a tabular form:

Effects of Croton Oil.

Patients' Names, &c.	No. 1. The dark-colored oil.		No. 2. The light-colored oil.	
	No. of stools.	G. Griping. H. Heat in the belly. V. Vomiting.	No. of stools.	G. signifies that the medicine caused griping. H. heat in the belly. V. Vomiting.
1. Mitchell—an Invalid. Bowels regular. Dose 1 minim	20	G.... H.....	13	G. H.
2. Williams—Hemiplegia. Bowels regular. Dose 1 minim, ...	1	.....	1	
Two days after the dose of 1 minim of No. 2 oil, this patient took 2 minims of No. 2 oil, its effects were	...	.....	4	
After a farther interval of 2 days, 2 minims of No. 1 oil were given, its effect were	3	Nausea.....		
3. Palin—recovered from delirium tremens. Dose one minim, ...	20	.....	10	G.
4. Kennedy—convalescent from dysentery, taking daily ℈i. of P. Jalap, and ℈ii. Cream of Tartar, which have procured six stools. Dose one minim,.....	9	G. H.	6	G. H.
5. Ricks—recovered from fracture of the leg and thigh, health good, rather costive. Dose one minim,....	6	H.	3	
6. Bulford—rheumatic affection of the left shoulder, health good, bowels regular. Dose one minim,.....	13	G. H. V....	7	G.
7. Todd—convalescent after delirium tremens. B. regular. Dose one minim,...	24	.....	3	
8. McKean—Invalid, recovered from delirium tremens. Dose one minim,.....	24	G. H.	7	G.
9. Faulkes—swelled testicle. B. regular. Dose one minim, ...	13	.....	1	
This man suffered nausea after the dose of No. 1 oil,—and profuse perspiration with nausea after taking No. 2 oil.				
10. Millar—a very costive habit. Sores on his legs healed recently. Dose two minims, ...	11			
After two days had a dose of one minim of oil No. 2, ...	...	.....	1	
Next day repeated one minim of No. 2,	...	.....	4	
After four days more he took two minims of No. 2 oil, ...	...	.....	4	
11. Williams—pain in right side, he yesterday took a dose of Calomel and Extract. Colocynth. C. āā ℈ss. without any effect. Dose one minim, ...	12	G. H.	7	G. H.
12. Goddard—pain in the belly for a long period, costive if he took no medicine, but he used to be purged 2 or 3 times by Pil. Hydr. Extract. Colocynth. C. āā g. v. Dose one minim,..... .	5	H.	10	H
He felt very sick after taking No. 2 oil.				

Patients' Names, &c.	No. 1. The dark-colored oil. No. ofstools.	No. 1. G. Griping. H. Heat in the belly. V. Vomiting.	No. 2. The light-colored oil. No. ofstools.	No. 2. G. signifies that the medicine caused griping. H. Heat in the belly. V. Vomiting.
13. Maine—costive. Dose one minim,...	10	G. H.	4	
14. Stockman—convalescent after a coup de soleil and drunkenness; he had been purged daily by Jalap. Dose one minim, No. 2 oil produced faintness.	17	G. H. V.	13	G. H.
15. Sperin—Gonorrhœa, costive. Dose one minim,.....	6	G. H.	9	G. H.
16. Porter—convalescent from rheumatism, costive. Dose one minim, ...	4	.....	5	G. H.
17. Barnett—paralysis of the lower extremities. B. regular. Dose one minim Was very faint after taking the dose of No. 2 oil,	13	G. V.	3	V.

The whole of the above experiments would show that the dark-colored oil, No. 1, was more active than the other sample in the ratio of eleven to six: the average purgative effects of 17 doses of the former being to produce eleven stools, and in that number, nine patients were griped, 10 complained of a disagreeable sensation of heat in the belly, and two vomited. The average effects of 18 doses of the light-colored oil, No. 2, was to produce 6 stools, and in those patients, seven complained of a sensation of heat in the belly, nine were griped, and one vomited. It would seem extraordinary that the average effect of 2-drop doses of No. 1 oil, in two patients, was only to purge four times, and of No. 2 oil to purge seven times. However, we must remember that the doses of two minims were only administered to patients of the most costive habits, on whom the dose of one drop had produced little or no effect, as will be seen by the detail in the table.

For the sake of greater accuracy, and because one specimen of oil was thicker than the other, the doses were divided according to the graduated minim measure, a fluid-drachm being made into 60 pills, with ʒii. of Pulv. Glycyrrhizæ and ʒi. of hard soap. It appears to me, that $\frac{1}{2}$ a minim of the milder sample of oil would be a more proper dose in all ordinary cases where an active purgative is required.

No. 21.

On Artificial Harrogate Water. By R. M. M. Thomson, Esq.

Mr. Thomson's opinion of the efficacy of artificial Harrogate Water is supported by his own experience in this country, as well as by the authority of Dr. Armstrong, on the value of the Dinsdale and Harrogate Waters, in many chronic affections of the stomach, liver, brain, and glandular system. Mr. Thomson strongly urges the employment of artificial Harrogate Water, in a variety of ailments, where mercury is known to be injurious; and in some chronic cases, after mercury ceases to be useful. He mentions one instance, where a patient with disease of the nose, had undergone a violent salivation with evident bad effect, and in whom the artificial Harrogate Water effected a cure; and another instance of extensive cutaneous disease in an infant, a few weeks old, which was ascribed to hereditary secondary syphilis; in that case also a cautious use of the artificial Harrogate Water accomplished a cure. In the treatment of chronic diseases, one great advantage of this water over mercurial alteratives, and in fact the majority of other remedies, depends on the property which it possesses of invigorating the constitution; at the same time that a tolerably free action of the bowels is kept up for many weeks, whereby the results of long-continued diseases are eliminated and subdued. The following formula for preparing the artificial Harrogate Water is given:

Into the centre vessel of Nooth's apparatus, put seven pints of water, with 21 drachms of Sulphate of Magnesia; into the lower vessel throw one ounce of the Sulphuret of Iron coarsely pounded, and on this pour one ounce of Sulphuric Acid, diluted with two ounces of water; in about three hours the saline solution in the centre vessel becomes strongly impregnated with Sulphuretted Hydrogen Gas, and should be drawn off into half-pint bottles, which are to be kept well corked and inverted. The dose is two or three ounces for an adult, and it may be repeated twice a day. The author considers this medicine one of the most powerful alteratives we possess, and well adapted to relieve many of the most obstinate chronic diseases which occur in India; he states that it acts powerfully on the secretions of the liver, skin, and kidnies, and is highly deserving of more extensive trial.

No. 22.

Cæsarean Operation. Presented by T. A. Wise, M. D.

A case of Cæsarean operation was communicated to Dr. Wise, by Dr. Leotard of Chandernagore, who assisted Dr. Tasse at the operation. The patient, aged 20 years, had a deformity of the pelvis, and after being in labor for four days, submitted to the Cæsarean operation, which was performed in the usual manner, and the dead child and placenta were removed; a bandage was then applied round the body, and the wound was left without any dressing for several hours, after which the edges of the incision were secured by the interrupted suture and adhesive plaster. The wound was healed in 40 days.

No. 23.

Swelled Leg resembling Phlegmasia Dolens, and Obliteration of the Iliac Vein. By J. C. Boswell, Esq.

On the 8th February, 1832, an emaciated Chinese pauper was brought before the Police at Penang, and from the circumstance of his not speaking, he was supposed to be insane; however, on examination, it appeared that the man was unable to speak in consequence of the extremely low and miserable state to which he was reduced. Besides the great general debility, there was an uniform swelling of the left lower extremity, extending from the toes to the groin. The limb was nearly three times the size of the other; it was cool, œdematous, and it pitted on pressure, but was rather elastic, and of much lighter colour than the opposite limb; the glands in the groin were not swollen. As only one limb was affected, the disease was not considered common œdema. The patient died on the 3rd day after he was first brought under observation. On post-mortem inspection, the cellular structure of the limb was found loaded with serum. The femoral vein was turgid with coagulated blood; the middle portion of the iliac vein appeared constricted, as if compressed by a ligature, and there were several enlarged and indurated absorbent glands near that part, from whence

upwards the cavity of the vein was filled with laminæ of firm coagula, the extremity of which extended across the lower part of the vena cava, above an inch into the right iliac vein, but there was no sign of disease in the vessels of the right side. The mesenteric as well as the bronchial glands were much enlarged and indurated; and there were extensive marks of chronic disease in the lungs.

No. 24.

On the Temperature of the Human Body and the state of the Pulse in Tropical Latitudes. By J. W. Macnee, Esq. Surgeon to the H. C. Ship Duke of Northumberland.

At the time I had the honor of being elected a Member of the Medical and Physical Society of Calcutta, I was requested by the Secretary, W. Twining, Esq. to undertake some experiments for the purpose of ascertaining the influence which the temperature of tropical latitudes exercises on the state of the pulse, and animal temperature of the human body. The only experiments I know on this subject are those at pp. 481, 482 of Dr. John Davy's Travels in Ceylon. Several observations on Europeans as well as Singalese are there recorded, which would afford reason to believe that the temperature of the human body in general, and of the extremities in particular, is higher within the tropics than in Great Britain; while the frequency of the pulse and of respiration are decreased : however, of the latter he states no detailed observations. The opinions of Dr. Davy have as yet neither been contradicted, nor have they been substantiated by the testimony of others. The annexed observations were carefully made, at eleven o'clock in the forenoon, on seven individuals, viz. two officers of the ship, two seamen, two soldiers, and one passenger; at different latitudes. There was so little difference in the temperature of the human body, observed in the same individuals at the equator, and within 200 miles of the Lizard, where the thermometer was above 20 degrees lower, that Dr. Davy's conclusions in this respect cannot be admitted to be inva-

riably correct. And as he has given no detailed statements respecting the frequency of the pulse and respiration in tropical latitudes, the subject may deserve a further and careful inquiry of some of the members of the Medical Society in India.

London, June 9th, 1832.

Date of the Experiment.	Man's No.	Temperature of the atmosphere.	Thermometer held for five minutes in the palm of the hand.	Thermometer under the tongue.	Pulse when the man was standing erect.	Pulse when the man was lying horizontally.	State of the Skin.	Other Remarks.
1832.								
Saugor, Jan. 27,	No.1	74	96	97	88	80	moist.	Somewhat excited at the moment of the experiment.
	2	,,	94	98	94	92	moist.	
	3	,,	96	98	92	86	moist.	
	4	,,	94	98	84	74	dry.	
	5	,,	92.50	97	80	78	moist.	
	6	,,	96	98	92	84	moist.	
	7	,,	89	96	72	80	moist.	
Long. 86, East. Lat. 0. Feb. 11,	No.1	83	96	98	72	60	dry.	
	2	,,	98	98	90	86	moist.	
	3	,,	95	98	72	70	dry.	
	4	,,	94	98	66	64	dry.	
	5	,,	95	9750	80	75	dry.	
	6	,,	98	98	78	70	moist.	
	7	,,	96	98	66	62	dry.	
Off Cape Lagullus, March 29,	No.1	63	90	96	86	82	dry.	
	2	,,	93	98	80	68	dry.	
	3	,,	92	98	90	80	dry.	
	4	,,	86	98	56	60	dry.	
	5	,,	84	97	80	80	dry.	
	6	,,	93	98	84	66	dry.	
	7	,,	92	97	65	63	dry.	
200 Miles from the Lizard, May 27, ...	No.1	60	88	97	76	68	dry.	
	2	,,	93	98	94	86	dry.	
	3	,,	83	98	84	82	dry.	
	4	,,	84	98	82	76	dry.	
	5	,,	83	96	88	84	dry.	
	6	,,	92	97	84	75	dry.	
	7	,,	69	94	72	60	dry.	

No. 25.

Abstract of Meteorological Observations, made on the Govt. Hill, Prince of Wales' Island, from 1st May, 1831, to 30th April, 1832. Elevation above the level of the Sea feet.

	Highest Tem.	Lowest.	Average range.	Mean.	Quantity of Rain.	Remarks.
1831.						
May, ..	78°	69°	71 *a* 76	73°	17.1	Rain on 21 days. Wind variable: southerly at the beginning, westerly at the end.
June, ..	78½	69	70 *a* 76	73	9.5½	Rain on 13 days. Wind variable.
July, ..	79	67	70 *a* 77	73½	9.5½	Rain on 12 days. Wind variable.
August,	77	68	70 *a* 75	72½	5.9	12 days with rain. Wind westerly for the most part.
Sept.....	76	66	68to73	73½	22.8	Rain on 24 days. Wind generally S. E.
October,	77	68	70 *a* 74	72	6.5½	Rain on 18 days. Tem. agreeable.
Nov. ..	76½	65	68 *a* 72	70	10.6	Wind N. W. and E. for the most part. Rain fell on 17 days. A good deal of Fog.
Dec.....	76	65	66 *a* 74	70	0.4	Rain on 2 days, the remainder fine. Wind N. W. or N. E. Weather extremely pleasant.
1832.						
January,	76	63	66 *a* 73	74	1.4½	Three days with rain. The weather throughout agreeable. Want of water begins to be felt below, but the heavy dews at night keep the air cool.
Feb.....	80	65	68 *a* 75	71½	0.2	Rain on one day only. Weather clear and pleasant. Wind for the most part easterly.
March,..	80	68	71 *a* 77	74	2.1	Rain on seven days. Hazy occasionally, but on the whole agreeable.
April, ..	80	69	71 *a* 74	73	10.9	18 days with rain; for the most part cloudy. Wind southerly.
Monthly Mean for the year,				72½	8.1	

The observations on the Great Hill were made by the Signal Serjeant, and I believe have been noted very fairly. The observations in the plain were made by myself.

Prince of Wales' Island,
28*th Sept.* 1832.

J. C. BOSWELL.

No. 26.

Abstract of Meteorological Observations, made on the North Beach, Prince of Wales' Island, from 1st May, 1831, to 30th April, 1832.

	Highest Tem.	Lowest	Average range.	Mean.	Quantity of Rain.	Remarks.
1831.						
May, ..	87°	75°	75 *a* 84	80°	9.9¾	Bar. max. 29°990, min. 29°800. Rain fell on 14 days. Wind, S. E. and variable. Weather inconstant.
June, ..	88	75	77 *a* 85	82	5.9	Bar. max. 30°010, min. 29°850. Rain on 11 days. Wind for the most part N. W. Weather agreeable on the whole, but uncertain.
July, ..	88	75	76 *a* 86	82	7.2	Bar. max. 30°000, min. 29°810. Rain or 11 days, much as last month in other respects.
Aug. ..	88	75	76 *a* 84	80	4.6	Bar. max. 30°000, min. 29°860. Rain on 7 days. Wind S. at the beginning, N. W. in the middle and end of the month.
Sept. ..	84	74	75 *a* 81	78	15.5	Bar. max. 30°910, min. 29°840. Rain on 20 days. Wind N.W. Generally hazy.
Oct....	87	75	76 *a* 84	80	5.8¼	Bar. max. 30°140, min. 29.790. Rain on 17 days. Wind N. W. Weather agreeable.
Nov.....	84	74	75 *a* 82	78½	8.5	Bar. max. 30°000, min. 29°800. Rain on 17 days. Wind N. W. agreeably cool.
Dec.....	84½	74	75 *a* 84	79	0.1½	Bar. max. 30°030, min. 29°900. Rain on one day only. Weather throughout extremely pleasant. Wind N. W.
1832.						
Jan.....	86	73	75 *a* 85	80	3.0¾	Bar. max. 30°040, min. 29°800. Rain on 7 days. Weather agreeable. Rain wanted for the country and road. Wind N. W. and N. E.
Feb.....	87	74	75 *a* 85	80	0.2	Bar. max. 30°000, min. 29°840. One day only with rain. Heavy dews makes the nights very cool and agreeable. Days rather warm.
March,	91	75	75 *a* 87	81	1.5½	Bar. max. 30°000, min. 29°800. Rain on 8 days. Great drought.
April, ..	88	75	76 *a* 85	80	6.1	Bar. max. 30°000, min. 29°820. Rain on 17 days. Wind variable, chiefly. N. W. The rain has done much good. Weather unsettled.
Monthly Mean for the year,				81	5.7¾	Throughout the year the nights in Penang are always cool.

The temperature has been taken three times a day, at 8 A. M., 3 and 8 P. M. from a Thermometer placed in an open verandah, in the shade.

The quantity of rain has been ascertained by a copper gauge sent from England.

Much has been said for and against the salubrity of Penang; for which reason I have taken considerable pains in keeping the above register, that all strangers, upon examination, may be able to form some idea of the weather they have to expect upon their arrival.

Had I written this a month ago, I might perhaps have joined with many others in anathemas against the climate, having just recovered from a severe attack of fever myself. But for five years until the late attack, from which I have now quite recovered, I ought to state that I have always enjoyed excellent health on this island, and I could quote the names of many Europeans who have resided here for 20 and 25 years in the enjoyment of perfect health. Nine cases of fever have occurred within the last two months, the majority of which I regret to say have proved fatal; but with one exception only, out of the whole number, the origin of the disease could be distinctly traced to exposure, fatigue, improper living, or all these causes conjoined; which would unquestionably have given rise to the same result in any tropical country. Like other parts of the world, Penang has no doubt its changes of season; there are some months which apparently predispose to disease more than others—July, August, and September might be marked in consequence, as the worst time for invalids to visit this island. But from October to April inclusive, the climate of Penang is delightful, and as a whole it is not going too far to say, that I prefer it to any climate I have yet been in.

I know no person by whose opinion I would be more readily guided on most matters connected with the climate of India, than Dr. J. Johnson: what his opinion was of the climate of Penang may be seen on reference to his work on Tropical Climates, p. 201, where particular mention is made of it. After a much longer residence on the island, both my observations and feelings induce me to subscribe to the general correctness of the description which he has given. I am far however from believing, that all the island is equally healthy: many parts of the interior, on the contrary, are undoubtedly the fruitful source of fevers and other diseases. A residence on the North Beach should always be preferred by all who visit the island for health, if they do not reside on the Government Hill, which on account of the much lower range of Temperature and the sublimity of the surrounding scenery is always to be preferred.

P. W. Island, 28th Sept. 1832. J. C. BOSWELL.

No. 27.

Abstract of the monthly averages of the Meteorological Register, at Calcutta, for the year 1832.

	Minimum Temperature observed at Sun-rise.			Observations made at apparent Noon.			Maxm. Temp. & Dryness, Osvd. at 2*h*. 50*m*.			Observations made at Sun-set.					
	Barometer reduced to 32°.	Temperature of the Air.	Depres. of M. B. Ther.	Barometer reduced to 32°.	Temperature of the Air.	Depres. of M. B. Ther.	Barometer reduced to 32°.	Temperature of the Air.	Depres. of M. B. Ther.	Barometer reduced to 32°.	Temperature of the Air.	Depres. of M. B. Ther.	Rain Gauge, No. 1.	Rain Gauge, No. 2,	No. of days in each month on which any appreciable quantity of rain fell.
January,	30,015	54,6	2,1	,020	71,6	12,3	,956	74,1	13,7	,962	69,2	9,0	..	..	..
February,	29,943	61,2	2,7	,953	76,3	12,5	,885	78,8	14,4	,886	73,4	8,7	1,65	1,50	1
March,	29,865	66,3	2,9	,890	83,6	15,5	,813	86,4	17,7	,803	80,0	11,1	3,10	2,7	3
April,	29,760	74,9	2,5	,720	92,2	14,3	,702	90,7	12,9	,760	78,6	4,2	2,36	1,90	4
May,	29,664	79,5	2,1	,626	96,9	16,9	,604	94,6	15,2	,692	82,3	3,9	3,45	2,88	4
June,	29,515	80,8	2,5	,460	92,4	10,4	,467	90,6	8,9	,526	83,4	3,9	4,26	3,48	9
July,	29,489	80,1	2,0	,460	87,3	6,3	,447	86,1	5,4	,526	82,8	3,4	4,36	4,97	12
August,	29,468	80,0	1,8	,440	86,5	5,9	,427	85,5	5,0	,510	82,2	3,4	16,44	13,46	20
September,	29,650	79,3	1,9	,620	86,6	6,6	,611	84,0	5,3	,702	81,5	3,4	4,88	3,63	13
October,	29,837	74,7	1,6	,794	85,6	9,2	,789	84,1	8,3	,850	78,7	4,2	8,15	6,01	6
November,	29,997	64,9	2,	,943	81,3	11,5	,942	79,8	10,4	,014	72,8	4,1	1,46	1,38	1
December,	30,998	55,8	1,6	,939	76,3	11,6	,931	74,9	11,1	,986	65,9	7,3	..	..	..

No. 28.

Resolutions of a Special Extraordinary Meeting of the Medical and Physical Society, held on the 7th Nov. 1832.

"It was unanimously voted, that to mark their deep sense of the active interest which Mr. Wilson has taken in the affairs of the Society for a period of nine years (during which he has filled the Office, either of President or Vice-President), and of the unceasing attention which he has paid to the Society's business from its first formation to the present hour; as well as for the readiness with which he has devoted his time and talents to its interests, and the ability and urbanity with which he has ever presided at the Society's Meetings, a suitable address be presented to Mr. Wilson, on his announcing his intention of returning to Europe;—accompanied by a piece of plate, which may serve as a permanent Memorial of the Society's Estimation and Respect."

In conformity with the above Resolution, a Silver Cup was presented to Mr. Wilson; and the following Address was read by Mr. Grant.

"Sir,

"On the part of the Medical and Physical Society of Calcutta I have been deputed to express to you the sentiments of cordial congratulation, which the members entertain on the auspicious occasion of your having been elected to a situation of high honor and distinction in one of the most eminent seats of learning in the world."

"To us, Sir, who have long enjoyed such opportunities of knowing and prizing your attainments in Literature and Science, it could be no matter of surprise, that you should be singled out for such preferment, and it was most gratifying to us to learn, that the University of Oxford, by nominating you to the Boden Professorship, confirmed the testimony of the public voice, respecting the person best qualified to hold it. To the members of this Society, too, it is a source of pride to think, that your deserts have not only obtained for you this honourable exaltation, but that two of the most celebrated Oriental scholars and critics of their age, the lamented Leyden, and yourself, belonged to the Medical Service of Bengal."

"Rejoicing as we do, and that most unfeignedly, at your deserved good fortune, in being thus enabled to return to your native land, in the vigour of your faculties and capabilities of usefulness and enjoyment; yet a feeling of regret *will* unavoidably mingle with our satisfaction, when we recollect that you are about to quit the land where your career has been so honourable and brilliant; and that this parting, in the nature of things, must with most of us be for ever."

"The deep interest you have always taken in the prosperity, respectability, and permanence of our Society, from its establishment, nearly ten years ago, to the present hour, demands grateful and public acknowledgment. By your constant attendance at our Meetings, you not only gave elasticity to our proceedings, but upheld a beneficial example to others, and proved your unwearied solicitude for the welfare of the Institution. In the more laborious details of Committee and other business of the Society, where much occurs that can be known to the public only by what appear general and simple results; we have ever found you a cheerful, careful, and active coadjutor. The readiness with which you have ever devoted your talents, to assist in promoting professional and scientific investigation, we have uniformly experienced and appreciated; more especially on subjects requiring an intimate knowledge of oriental literature and customs. As Vice-President, and latterly as President of the Society, we have admired the ability, impartiality, and urbanity, with which you have guided our discussions, as well as the tone of moderation and good-feeling which your personal bearing and manners tended so much to foster and preserve among us."

"In order to give due expression and effect to these sentiments; no less than to place on record the feelings by which we have been actuated; an Extraordinary Meeting of the Society was convened on the 7th November, at which the resolution just read, was unanimously voted."

"Pursuant to this resolution, we have now to present to you this Memorial of the feelings of the Society towards you. Be pleased then, Sir, to accept of this Silver Cup, as a mark of the deep sense we entertain of your valuable services to our Institution; and as a

parting token of the lasting regard and esteem, in which, individually and collectively, we hold you. May it often, in your native land, serve to remind you of your distant friends and fellow-labourers in science and literature in the East; and now, Sir, with the sincerest good wishes for your continued good health, happiness, and long life, we bid you—FAREWELL!"

The President then rose, and addressed the Society to the following purport:

"In accepting the highly flattering expressions by which your sense of my service as President of the Society has been conveyed to me, and the Testimonial of your regard by which they are accompanied, I cannot but feel that I am appropriating to myself more than is my due,—more than I had any right or reason to expect. Removed since the period of my arrival in India, from strictly professional duties, it has not been in my power to bring to our Meetings that knowledge and experience which the President of such a Society should possess; and if I ventured to contribute to the early volumes of our Transactions, it was with the hope of inducing others better qualified than myself to come forward and communicate to the profession and the public, the results of their observations, and not from any overweening estimate of the value of my contributions. All that was in my power, therefore, was to give that attendance which my situation imposed, and to take my share in the duties which the Society required, and in which, the knowledge and zeal of my associates rendered mine an easy task. If therefore there be any obligations in the case, they are at least mutual; and whatever services I may have rendered, they have been fully repaid by the kindness and consideration I have ever experienced from the Members of the Society."

"Gentlemen,—The first proposal to me to join in the formation of this Society, (when made by two friends, whom I survive to lament, Dr. Hare and Dr. Adam,) was received by me with feelings of unmixed satisfaction. From the period of my arrival in Calcutta, to that time, there had been little or no communication amongst Medical men in this country, either in Calcutta or the Mofus-

sil. In the former, the few who were settled were wholly engrossed by practice; and the residents of the latter were never heard of except through official channels. The institution of the Society has removed this depressing and unsocial state of our profession, and has been not more conducive to the diffusion of useful knowledge than to the promotion of kindly and cordial intercourse amongst ourselves. The residents in Calcutta have now assured opportunities of meeting and interchanging their views and opinions, and the residents in the Mofussil feel that they are no longer isolated individuals, but the members of a body interested in their pursuits, and by which the results of their labours will be duly appreciated. The expectations I was led to form of the good effects of the establishment of this Society have been fully realized, and during the period of my connexion with it, to which you have adverted, the impressions with which I first became a member of it, have never been impaired. This last occurrence in the history of my connexion with the Society is calculated to confirm them, and I shall never revert to the period during which I belonged to it without feeling the deepest and warmest gratification."

"Gentlemen,—I will not further occupy your time than to repeat my sincerest acknowledgments to you, for all past and present kindnesses, and to express my fervent wishes for the prosperity of the Members of this Society, collectively and individually, and notwithstanding the melancholy forebodings of my friend Mr. Grant, I hope, that not many years may elapse before some of you at least will have an opportunity of witnessing how proudly, how sacredly I cherish this Memorial of your regard—how delightedly I shall hail every object, every individual that may recal to my recollection the many happy hours I have spent amongst you—the friends I am proud to think I have formed, and whom I regret to leave amongst the members of the Medical and Physical Society of Calcutta."

No. 29.

Donations to the Library.

Donors.	*Donations.*
G. Waddell, M. D. ..	Glasgow Medical Journal, vol. III.
J. F. Royle, Esq. ..	Dionis' Surgery, LeDran's do, Lommius de Febribus, Sennertus' Epitome Institut. Medicinæ, cum libro de Febribus. Albertus Magnus de Morbis Mulier. Michaelis Scotus Opusculum de Secretis Natur.
F. P. Strong, Esq. ..	Hermannus Vander Heyden, Opusculum.
W. Burke, M. D. ..	Hennen's Medical Topography of the Mediterranean.
J. N. Casanova, M. D. ..	Description of the Mineral Waters of San Pedro, in the Havana.
Sir G. Blane, Bart. ..	Observations relative to Contagion in Cholera.
Medical Board of Bengal, ..	A copy of the Rules and Regulations for the performance of Quarantine at Calcutta.
Ditto ditto, ..	List of the Members of the Royal College of Surgeons of London.
J. Tytler, Esq. ..	A copy of an Arabic version of the Aphorisms of Hippocrates.
The Plymouth Institution, ..	Transactions of the Plymouth Institution, vol. I.
T. E. Baker, Esq. ..	Popular Appeal in favor of Anatomy.
W. Warlow, Esq. ..	Wiedman on Nerosis, Dessault's Surgery, McGregor's Medical Sketches of the Expedition to Ægypt, Magendie's Journal.
H. Piddington, Esq, ..	A Copy of his Index to the Plants of India.

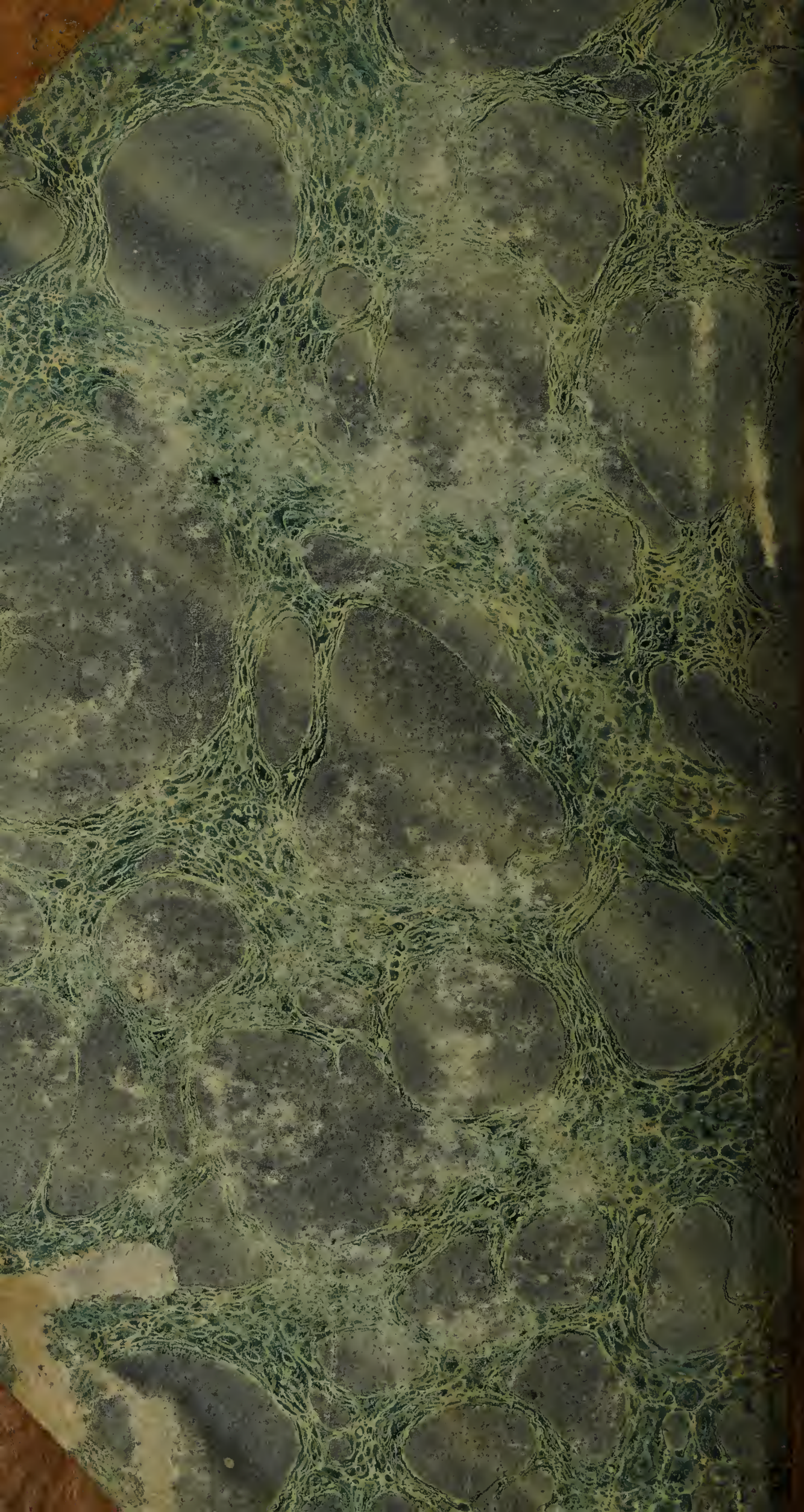
R. H. KENNEDY, M. D. ..	Pontoppidan's History of Norway. Four Sanscrit works, viz. *Atreya Sunhita*, a system of Medicine, supposed to be narrated by the Rishi Atri to Harita. *Serangdhara*, a work chiefly in Pharmaceutical operations, but treating also of the Practice of Medicine. *Chikitsa Sara*, the Essence of Medical Practice, a system of Medicine. *Gada Nigraha*, Suppression of Disease, a system of Medical Practice, incomplete. A Persian work, *Baz Nama*, a treatise on Falconry.
H. H. WILSON, ESQ. ..	Baker on Preserving Health, Atkinson on Lithontrity, Elliotson on Prussic Acid: the works of Hippocrates, Dioscorides, Castelli, Jervis, Bell, Denman, Smythson, Cullen, Ætius, Smelli, and Tacheron, with Haighten's Lectures, in all 35 vols.
DR. BOGGIE, ..	The works of Capuron, Cloquet, Orfila, Thenard, Alibert, Lænnec, and Richerand, 15 vols.; also the Bulletin Universel de Ferussac, 3me. Section, and Revue Medicale.
DR. HAYS, ..	Four Pamphlets on Medical subjects.
J. O. WALKER, ESQ. ..	Copies of the Bombay Quarantine Code, in English, Persian, Goozratee, and Mahrattee.
M. JULIEN DESJARDINS, ..	Analysis of the Proceedings of the Society of Natural History of the Mauritius; also a series of the Proces Verbal of that Society.
Capt. B. ROXBURGH and Lt. J. ROXBURGH, the publishers, ..	Dr. Roxburgh's Flora Indica, in 3 vols.
JS. PRINSEP, ESQ. ..	Asiatic Researches, vol. 17. Journal of the Asiatic Society, vol. 1.

No. 30.

Donations to the Museum.

Donors.	*Donations.*
R. N. Burnard, Esq.	* 4 Specimens of Urinary Calculi, removed from Natives by the operation of Lithotomy.
Colonel Tod,	Several Lignites from Van Diemen's Land.
	2 Specimens of Ornythorynchus Paradoxus; and a variety of Birds.
J. F. Royle, Esq.	103 Specimens of Materia Medica.
H. H. Goodeve, M. D.	The Iron Shaft of an Arrow extracted from the body of a Native Trooper.
H. H. Spry, Esq.	86 Specimens of Indian Materia Medica.
J. N. Casanova, M. D.	Detritus afforded by 2 cases of Lithontrity.
T. A. Wise, M. D.	A Biliary Concretion.
T. Ward, M. D.	Specimens of Worms voided per anum, by the Mantis Religiosa at Penang.
W. Mitchelson, Esq.	An Urinary Calculus from a Native.
W. Bell, Esq.	3 Ditto ditto ditto.
J. C. Boswell, Esq.	A Tumor removed from the breast of a Siamese.
	Preparation of obliteration of the Iliac Vein, from Phlegmasia Dolens in a male subject.
F. H. Brett, Esq.	14 Specimens of Urinary Calculi extracted from Natives of India by the lateral operation of Lithotomy.

* Mr. Burnard has forwarded to the Museum, the Calculi extracted from 15 other native subjects; but they arrived when the last sheet of this work was in the press, consequently too late to admit of the succinct account with which they are accompanied being included in this volume.

W. Darby, Esq. ..	4 Specimens of Urinary Calculi, extracted from Natives of India.
W. L. McGregor, M. D. ..	A large Urinary Calculus, extracted from a Sikh.
T. A. Wise, M. D. ..	Three Renal Calculi, voided per Urethram, by a Hindoo.
A. K. Lindesay, Esq. ..	Nearly 2 oz. of Hempseed Calculi, taken from a diseased Kidney of an European, resident 40 years in India.
A. Campbell, M. D. ..	2 Specimens of the Pendulous Tumors of the Ear, common in Nipal.
	Steatomatous Tumor removed from the sheath of the Penis of Dog, in Nipal.
	Specimens of Goitre in Kids and Sheep in Nipal.
M. Julien Desjardins, ..	Several objects of Natural History.
T. A. Wise, M. D. ..	A Biliary Concretion from the Human subject.

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